

2.1.4 Labour Force

The labour force is here defined as the population between 15 and 65 years old. Although the survey does not allow for a detailed analysis of the productive population, data on male adult workers were calculated and presented in the table below.

Table 7: Male Adult Workers per Household Size

District	Measure	Household size				F test
		3-6	7-10	11-14	>14	
Argu	Mean	1.32	2.00	2.81	3.89	0.00
	St dev	0.48	0.96	1.05	1.27	
	as % of total population	24	23	23	22	
Warduj	Mean	1.50	1.56	2.60	4.00	0.00
	St dev	0.83	0.65	0.70	1.58	
	as % of total population	30	19	21	20	
Zebok	Mean	2.00	2.46	2.82	5.00	0.00
	St dev	0.63	1.13	0.75	1.57	
	as % of total population	36	29	22	26	

Table 7 shows that the average male labour force per household increases with the size of household in all the districts. This difference between the size classes is statistically significant for all of the cases as given by the F test. For Argu district, it increases proportionally to the number of household members; the share of male workers in the total population remains stable over the different household size groups. For the other two districts, small households tend to have a larger male working population than larger households. In Warduj, the male worker population is 10% higher in households with 3 to 6 members than in the other groups. The same difference holds for the first two and the last two household size groups in Zebok district. In terms of inter-district comparison, the proportion of male workers in Zebok stands well above that of the two other districts.

The dependency ratio calculated in Table 8 represents the number of “non-productive” members per “productive” member. The non-productive population includes children below 15 and adults over 65 years old, and the productive members constitutes the labour force as defined above.

Table 8: Dependency Ratio

District	Measure	Household size				F test
		3-6	7-10	11-14	>14	
Argu	Mean	1.46	1.50	1.44	1.39	n.s.
	St dev	1.06	1.15	0.62	0.75	
Warduj	Mean	1.09	1.67	1.31	1.67	n.s.
	St dev	0.93	0.97	0.48	0.69	
Zebok	Mean	0.94	1.13	1.25	1.04	n.s.
	St dev	0.65	0.79	0.59	0.64	

Note: n.s. stands for not significant

A dependency ratio lesser than 1 indicates that there are more productive than non-productive members in the household. This is the case for the small household size class in Zebok district. In the other cases, the ratio is greater than 1 implying more non-productive population relative to productive ones. Zebok district as a whole is better off than Argu and Warduj in term of this criterion; as a consequence of a favourable dependency ratio and a more widespread migration behaviour, the labour force is less burdened in Zebok. The F test indicates that the mean dependency ratio for each household size class is not significantly different from another.

The unemployment, which is very high in some areas, adds to the burden of male workers to meet their family needs and forcing them to leave the villages in search of employment.

Table 9: Able-Bodied Male Working Away from the Villages

	Argu	Warduj	Zebok
% of male workers in the labour force	51	48	51
% of male workers who migrated in search of employment	10	15	23
% of the labour force who migrated in search of employment	5	7	12

In Zebok, 23 percent of male workers are working away from their villages. In Argu and Warduj, unemployment is less a striking problem and, consequently, fewer male workers have migrated to earn income.

2.1.5 Refugees

The 1990 Eighmy study reported a very low refugee movement in Badakhshan province with 0.05 percent of the population as refugees. In 1999, the village elders consulted for the survey reported a certain number of refugee families still living away from their village of origin as reported in Table 10.

Table 10: Number of Refugees

	Argu	Warduj	Zebok
Number of families who left during the war	67	57	9
Number of families still refugees elsewhere	57	15	7
Estimated current refugee population	331	79	34
% of current refugees in the total population	7.1	2.38	2.52

The present refugee population in Warduj and Zebok districts represents a small share of the population whereas in Argu it still accounts for 7% of the total population.

2.2 Education

The number and age of children going to school is a first indicator of the level of education. However such information must be linked to availability and accessibility of schools to be meaningful. Table 11 details for each village the type of schools available and at what walking distance they are located.

Table 11: Availability and Accessibility of Schools

District	Village	Boys' schools		Girls' schools	
		Level	Distance from village	Level	Distance from village
Argu	Baghishah	PS	1.5 hrs		
	Bakhtishah	PS	1 hr	P	1 hr
	Barlas Janmurad	P	40 mn		
	Shamary	PS	40 mn	PS	1.5 hrs
Warduj	Bashend	P	0		
	Morkan	PS	0	P	2 hrs
	Rukhshan	PS	1 hr		
	Soofian	P	1.5 hrs		
Zebok	Gulkhana	PS	40 mn (4 hrs when flood)	P	40 mn (4 hrs when flood)
	Khulkhan	PS	20 mn	P	20 mn
	Kolalha	PS	4 hrs	P	4 hrs
	Redkhod	PS	3 hrs	P	3 hrs

Note: P stands for primary school and S for secondary school

Distances are expressed in hours (hrs) and minutes (mn). A distance of 0 means that the school is in the village

Although all villages have access to primary boys schools and most of them to secondary boys schools, pupils might have to walk up to 4 hours to the nearest school. As far as girls schools are concerned, only one village has all year round access to such school at less than one-hour walking distance.

Table 12 indicates the overall percentage of children of school age actually going to school. The data are incomplete to disaggregate the percentage of girls and boys.

Table 12: Schooling and Literacy

District	School enrolment (as % of children of school age)	Literacy rate (as % of the sample)
Argu	32	8
Warduj	21	4
Zebok	30	10
Total	28	7

In general, only one child of school age out of 3 is going to school. The situation is particularly critical in Warduj district where only one child out of five goes to school. A breakdown of school attendance per village showed that the walking distance between villages and schools is not a determinant factor. Neither is the availability of schools and secondary studies for girls. The literacy rate is strikingly low in all three districts. The situation is again more alarming in Warduj where only 4 percent of the population interviewed is literate. A detailed analysis of the schooling and literacy level is given in Table13.

Table 13: Schooling and Literacy According to Household Size

District	No of literate persons				F test	No of children enrolled in school				F test
	3-6	7-10	11-14	>14		3-6	7-10	11-14	>14	
Argu	0.42	0.56	1.50	1.44	0.00	0.26	0.92	1.69	1.89	0.00
Warduj	0.21	0.36	0.20	0.78	n.s.	0.38	0.88	0.50	0.44	n.s.
Zebok	0.17	0.62	0.73	1.93	0.00	0.17	0.31	1.36	1.50	0.00
Total	0.29	0.50	0.92	1.47	0.00	0.31	0.80	1.27	1.31	0.00

One characteristic of Warduj district with regard to education and literacy is that the mean number of literate and educated members does not increase with an increase in the size of households. This point is highlighted by the F test showing a statistically not significant difference between the class intervals. By contrast, in Argu and Zebok districts the mean number of educated and literate persons increases as expected, with household size.

2.3 Health Practices

2.3.1 Availability of Medical Services

Information related to availability of medical services has been collected at the community level. The situation, as prevailed in each village, is presented in Table 13. Medical centres include clinics and hospitals. Trained medical persons are medical assistants and paramedics.

Table 14: Access of the Communities to Medical Services

District	Village	Walking distance to the nearest medical centre (in hours)	No of trained medical persons	No of traditional birth attendants (TBAs)	Village population (approx.)
Argu	Baghishah	1.5	1	0	700
	Bakhtishah	1.5	0	4	1300
	Barlas Janmurad	1.5	4	10	770
	Shamary	3/4	3	7	1900
Warduj	Bashend	2.5	3	3	1400
	Morkan	1/2	4	6	1100
	Rukhshan	1.5	0	5	340
	Soofian	4	1	10	480
Zebok	Gulkhana	3/4(4 when flood)	3	4	400
	Khulkhan	1/2	3	0	400
	Kolalha	4	0	10	290
	Redkhod	3	3	4	260

Out of the 12 villages, only 4 have access to a medical centre at less than one hour walking distance and another 4 are situated at more than two hours walking distance from the nearest medical centre. The availability of trained medical persons and TBAs varies from village to village but remains extremely poor compared to the total village population. An immunisation team is permanently present in Argu district; the walking distance is equivalent to that of the medical centre. In Warduj, villagers reported that an immunisation team comes in the village several times a year (between 2 and 4). The information with regard to vaccination accessibility was inaccurate but Médecins Sans Frontières (MSF) and World Health Organisation (WHO) seem to be present in the district.

2.3.2 General Indicators

The information presented in this section has to be considered carefully. Questions related to health practices have been answered by the heads of households and not by the women. For this reason, some answers might be inaccurate or incomplete.

Data to determinate the birth rate per woman were not collected; therefore, we will use the mean number of births per household as an indicator of fertility. There are on average close to 9 births per household in the three districts as a whole. However, this figure is higher in Zebok than in Argu and Warduj as indicated in Table 15. This is explained by the fact that there are more larger households in Zebok than in the other districts. As the household size increases, the mean number of births per household increases as well. The F test shows that the average number of births per household is statistically different from one class to another.

Table 15: Mean Number of Births per Household

District	Household size					F signif. level
	3-6	7-10	11-14	>14	Overall	
Argu	5.47	7.44	11.63	14.67	8.47	0.000
Warduj	4.79	8.68	10.50	11.89	8.00	0.000
Zebok	4.33	7.23	10.82	14.64	10.09	0.000
Total	5.00	7.82	11.08	13.88	8.74	0.000

It was reported that most of the births are attended by TBAs: 63% of births in Argu, 89% in Warduj and 82% in Zebok. All the villages in Warduj have an attendance rate equal to or greater than 85%. In Zebok, attendance rates are 80% or more, apart from Kolahla village where it drops to 50%. The records for Argu are weaker; only between 48% and 81% of the births are attended by TBAs.

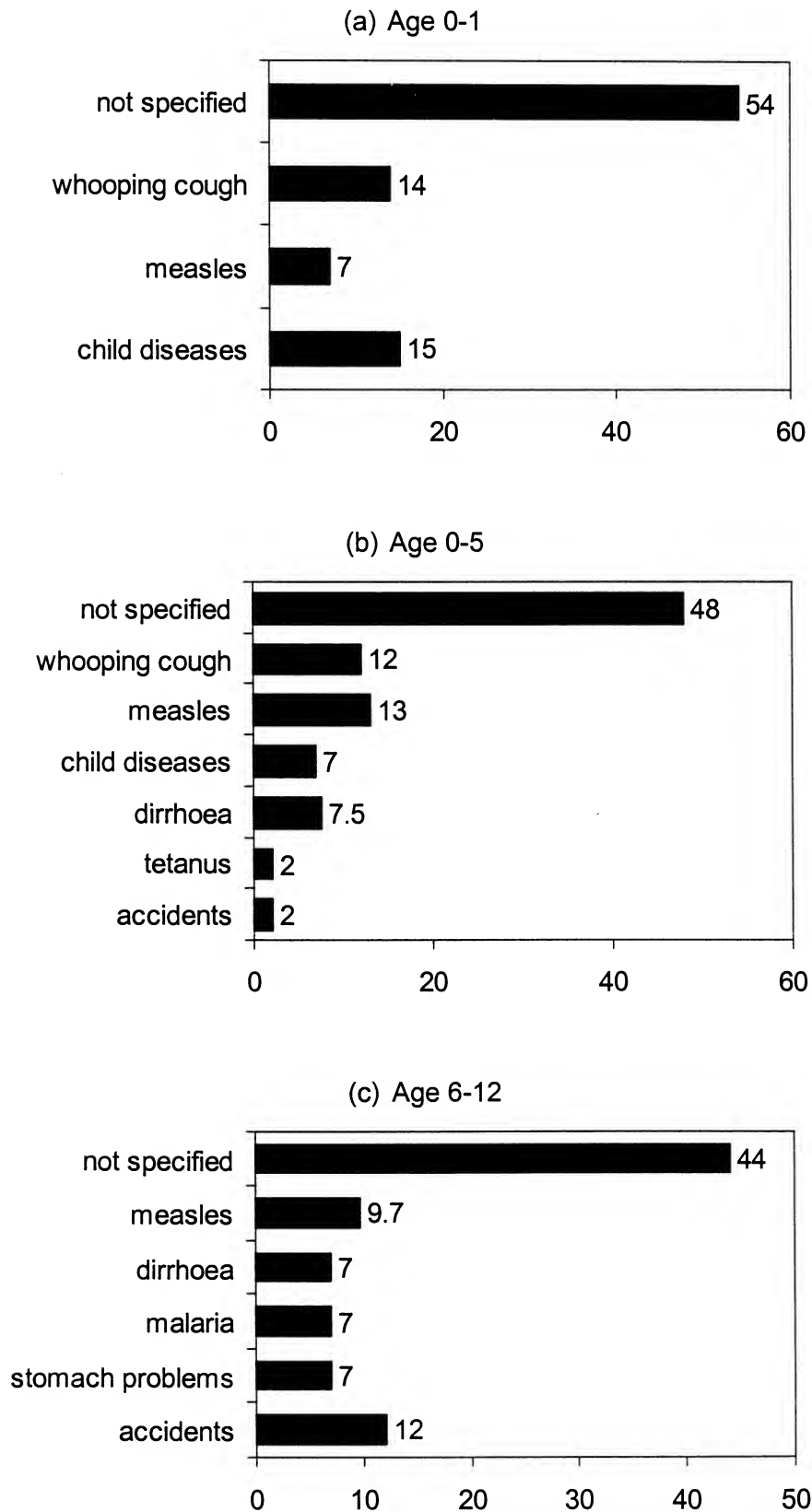
Despite a large proportion of the births attended by TBAs, the childhood mortality is high in all the three districts: more than one child out of four will die before reaching 13 years old. The infant and child mortality rates are presented in Table 16.

Table 16: Infant and Child Mortality Rates

	Argu	Warduj	Zebok
% of infant died before 1 year	3.5	4.5	6.5
% of children died before 6 years	20	17	19
% of children died before 13 years	27	26	27

The childhood mortality rate is especially high during the first five years. In Argu and Zebok, one child out of five dies before the age of 6. In all the districts surveyed, around 70% of deaths occur in children 5 years and under. After 5 years old, the mortality rate is considerably lower, and 9% of the childhood deaths occur between 6 and 12 years old.

Figure 3: Main Causes of Child Mortality by Age Group (percentage of child deaths)



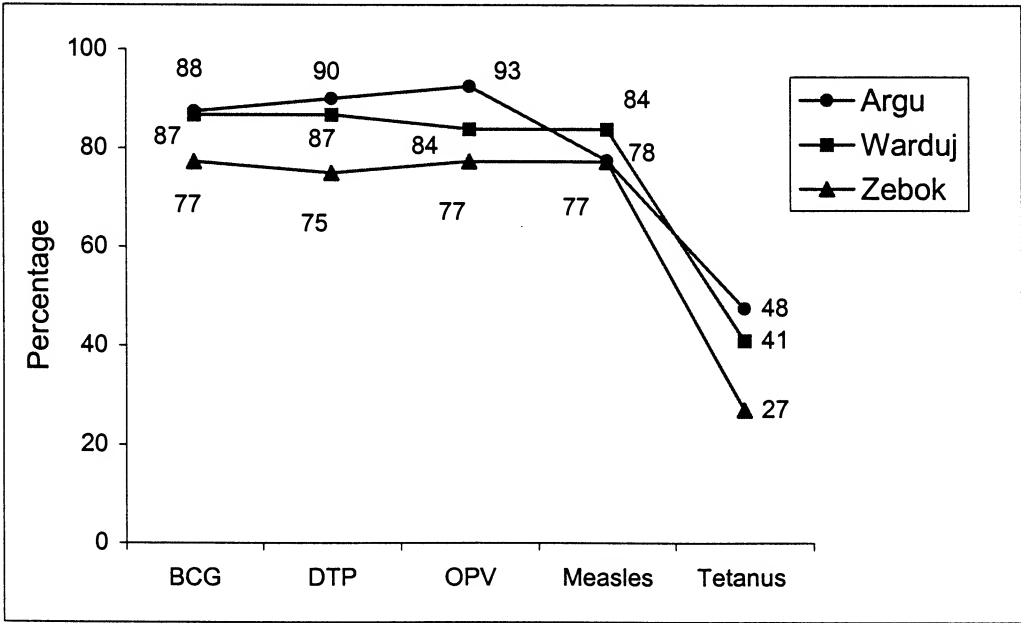
The causes of death also differ according to the age category; the major reasons for death are presented in Figures 3a, 3b and 3c. Whereas diseases are the main cause of death among children up to 5 years old, deaths among children of 6 to 13 years old are attributed to other causes. Older children are more threatened by *accidents* that includes fighting, bombing, mining, drowning and falling from the hills. It is also important to note that respondents were not able to indicate the causes of death for about 50% of the cases. In the case of infant mortality, 69% of the people interviewed did not provide any answer and were unable to define the diseases that account for the deaths.

2.3.3 Diseases and Immunisation

Village elders reported malaria, tuberculosis (TB), flu and diarrhoea as the most common diseases. They also mentioned epidemics of tuberculosis, cholera, malaria and typhoid but were not able to specify the exact time period they occurred.

Figure 4 gives a measure of children immunised against tuberculosis (BCG vaccine), diphtheria, whooping cough and tetanus (DTP vaccine), polio (OPV vaccine), and measles; and women immunised against tetanus.

Figure 4: Percentage of Children and Women Vaccinated



In each district, the coverage rate for BCG, DTP, OPV and measles is very similar- only measles vaccination in Argu contrasts with the vaccination against the other diseases. The immunisation rates are particularly high in Argu and Warduj districts. The coverage rate in Zebok is slightly lesser but nonetheless 77% of the sampled population reported that their children have been vaccinated against the most common diseases. By contrast, the percentage of women vaccinated against tetanus is very low. The coverage rate is 48% in Argu, 41% in Warduj and only 27% in Zebok.

Although village elders mentioned WHO and MSF immunisation teams to be occasionally present in the district, data suggest insufficient coverage.

Health education has been provided to 34% of the population surveyed in Argu, 1.5% in Warduj and 41% in Zebok. Table 17 highlights the difference in immunisation coverage between the population which received and that which did not receive health education. The comparison is done only for Argu and Zebok where health education was provided.

Table 17: Percentage of Children and Women Vaccinated

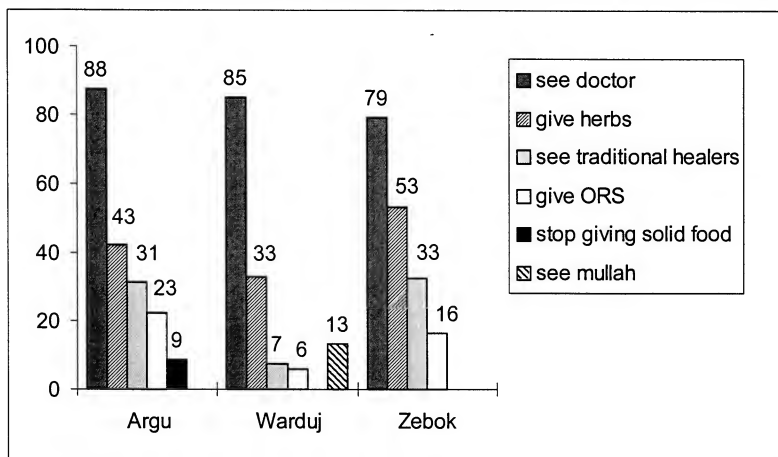
District	Argu		Zebok	
	Health education	No health education	Health education	No health education
BCG	93	85	83	73
DTP	93	89	83	69
OPV	96	90	83	73
Measles	59	87	83	73
Tetanus	44	51	61	8

The general observation is that households that received health education, have higher vaccination records. The difference is particularly significant in Zebok. Immunisation against measles and tetanus in Argu district are exceptions to this.

Diarrhoea is among the main fatal diseases in the area surveyed. Figures 3b and 3c suggest that diarrhoea is the cause of 7% to 7.5% of the childhood deaths. Unlike the other child diseases, there is no vaccine for diarrhoea. The only treatment for diarrhoea has been raising the awareness of households, particularly the women.

Figure 5 gives the frequency distribution of the main treatments currently adopted by the population interviewed to stop diarrhoea. Each person was able to give several answers. Seeking medical treatment from a doctor is the most popular way of tackling diarrhoea. Beside this, households, especially in Warduj district, also seek help from traditional healers and mullahs. Among the techniques used, giving herbs is the most common. Although it is not noxious, it does not have a high curative potential. Some 9% of the responses were to stop giving solid food but this cannot stop diarrhoea and even may worsen the health of a sick child. The best treatment- giving oral rehydration solution- (ORS) is the less adopted method in Warduj and Zebok where, respectively, 6 % and 16% of the households use this technique. In Argu, ORA use is more common among the population interviewed.

Figure 5: Frequency Distribution of Diarrhoea Treatments Used by the Sampled Population



The data collected do not provide evidence of a correlation between receiving health education and being familiar with ORS. However, it appears that in Argu where health education coverage is better than in the districts, 20 households out of 80 surveyed said they are familiar with ORS and among them 15 received health education. In Zebok, 8 households out of 44 are familiar with ORS and 6 of them received health education.

2.3.4 Diet

Poor nutrition, in quantity as well as in quality, impinges upon health. The major source of income in Argu, Warduj and Zebok is linked to agriculture and livestock. Every year, the off-season represents a period of food shortage for a large proportion of the population. On the average, 68% of the sample population experience food shortage in Argu, 74% in Warduj and 91% in Zebok. A breakdown by household size class (see Figure 6) shows that smaller households experience relatively more food shortage than larger ones. In Argu and Warduj, households with over ten members adapt more easily to periods of food shortage than households with ten members or less. In the case of Zebok, all the households are "severely" affected by food deficit. Warduj and Argu are, by comparison, less severely affected. The length of food shortage periods also differs between the districts. In Argu, households experience food deficit for an average of 2.5 months per year, whereas in Warduj and Zebok it lasts for 2.7 months per year. Reducing the number of meals per day is the extreme solution adopted by the affected population.

PART I. INTRODUCTION AND METHODOLOGY

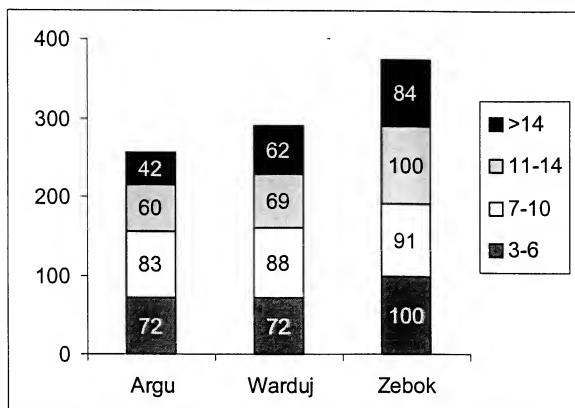
1.1 Introduction

Having undertaken a brief PRA survey in some villages in Ishkashim district, Badakhshan Province, Afghanistan started the Community Development Programme (CDP) in 1966 as a pilot project. Since 1997 the CDP, supported by the Engineering Programme, has been implemented in five districts in the province. However, there is a dearth of information from these Programme districts that can be used as a benchmark to measure impact. Recognising this a baseline survey was implemented in 1997 but only in Ishkashim district. This baseline survey covers three of the remaining four Afghanistan Programme districts in Badakhshan province, namely Argu, Warduj and Zebok. The objective of the survey was to compile a baseline data that can be used as a benchmark indicator for subsequent evaluation of the impact of Afghanistan development programmes on the standard of living of the stakeholders.

1.2 Data Collection Methods

A combination of PRA and formal interview methods was used to gather the baseline information. Two detailed questionnaires were administered to community members and households. The main research tools from PRA were group discussions, with heads of households and key informants, and direct observation. Group discussion is central to the methodology of PRA. Following this tradition, a total of 12 group meetings (one in each village) were held and community-wise information was collected on such subjects as infrastructure, agriculture, irrigation system, health, education, population movement, agrarian systems, resource management and market accessibility. The household survey focused on household characteristics, including incomes, expenditures and agricultural activities. While household heads were purposively selected to represent the variability within the villages, "key informants" were interviewed for information on the broader system beyond their household. The key informants included mullahs, shopkeepers, farmers and transporters. This methodology has satisfied the requirements of the survey by permitting the collection of both qualitative and quantitative information from representative households and villages.

Figure 6: Percentage Population Affected by Food Shortage by Household Size



In order to evaluate the composition of the population's diet, we assume that the crops cultivated and the area corresponding to them are relevant indicators. In all three districts, the diet is dominated by wheat, but it is much more diversified in Argu and Warduj than in Zebok. In Argu, 85% of the land is planted with wheat and, besides chickpeas, barley is also grown in that order of importance. Only little vegetables, potatoes and maize complement the diet. The situation is similar in Warduj. Potatoes are not grown but fruit, rice and maize are more important in the diet. Vegetables remain scarce. In Zebok, 49% of the land is planted with wheat, 35.7% with barley, 14.7% with chickpeas and the rest with maize. The diet is poor and not diversified which explains that in periods of food deficit the population is less likely to find substitutes and, consequently, more likely to be severely affected.

2.3.5 Drinking Water and Sanitation

Availability and accessibility of drinking water are determinants of good health and hygiene. Figure 7 indicates that all villages have access to spring or river water. Streams, canals and wells are scarcer and only a small share of the population has access to these water sources. 19% of the population in Warduj get their water from canals; there is no canal in the other districts. Two wells have been built in Shamary village, in Argu. Among the population sampled, 8 households use covered well and 4 households use well with a hand pump. At 91%, spring water is the major source of drinking water. The sources of drinking water have been improved in 3 villages: the springs in Bakhtishah village, Argu and Khulkhan village, Zebok, and the wells in Shamary, Argu. The springs were improved by Afghanaid and the wells by the Swedish Committee for Afghanistan. The projects are maintained by the communities.

Figure 7: Percentage Distribution of Households by Source of Drinking Water

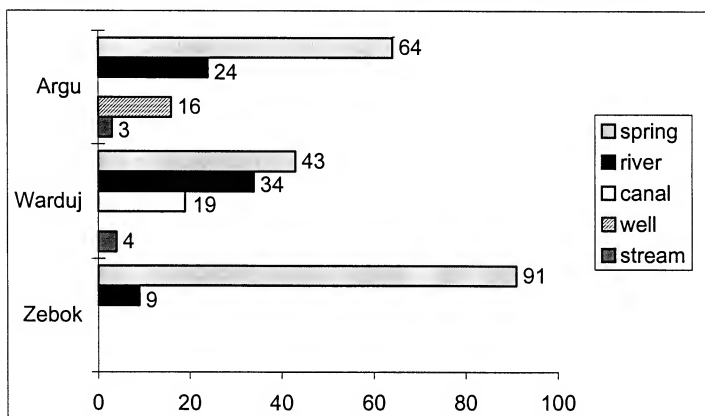


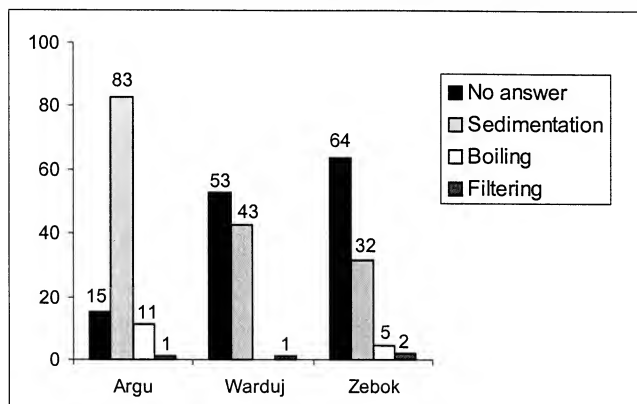
Table 18 presents the mean distance between villages and the nearest source of drinking water for each "distance-class", and the percentage of the population accessing. For example, 24% of the population sampled in Argu has to walk less than 100 meters up to the water source; on average this group has to walk 42 meters. Argu has the larger proportion of the population living far from the source of drinking water; almost half the population has to walk between 200 meters and 1.5 kilometres to fetch water. In Zebok it represents a quarter of the population. The standard deviations for the class ≥ 200 suggest little homogeneity within the class. It is particularly true in Argu where 10 households reported a distance of 1 to 1.5 kms, and in Zebok where 2 households reported a distance of, respectively, 1 and 2 kms. In Warduj, the sources are closer to the homesteads, the maximum being 500 meters for 2 of the villages and 200 meters for 2 other villages.

Table 18: Mean Distance from Villages to Drinking Water Source

District	Measure	Distance to water source in meters			F test
		0-99	100-199	≥ 200	
Argu	Mean	42	107	534	0.000
	St dev	20	18	388	
	% of population	24	30	46	
Warduj	Mean	26	110	311	0.000
	St dev	15	20	145	
	% of population	63	24	13	
Zebok	Mean	32	103	527	0.000
	St dev	18	13	568	
	% of population	41	34	25	

Since a large number of people use the same source of water, it is assumed that this water is not always clean. Households were, therefore, asked how they purify the water- if they do at all. The responses are presented in Figure 8. Boiling and filtering is not widely used; instead sedimentation is most commonly used, especially in Argu. It would seem that interviewees in Argu are more aware of sanitation practices than in the other districts where most of the people did not provide any answer. It should be noted that in Zebok where spring is the main source of drinking water, some respondents insisted that this water does not get dirty at all.

Figure 8: Frequency Distribution of the Population Sampled by Means of Purifying Water



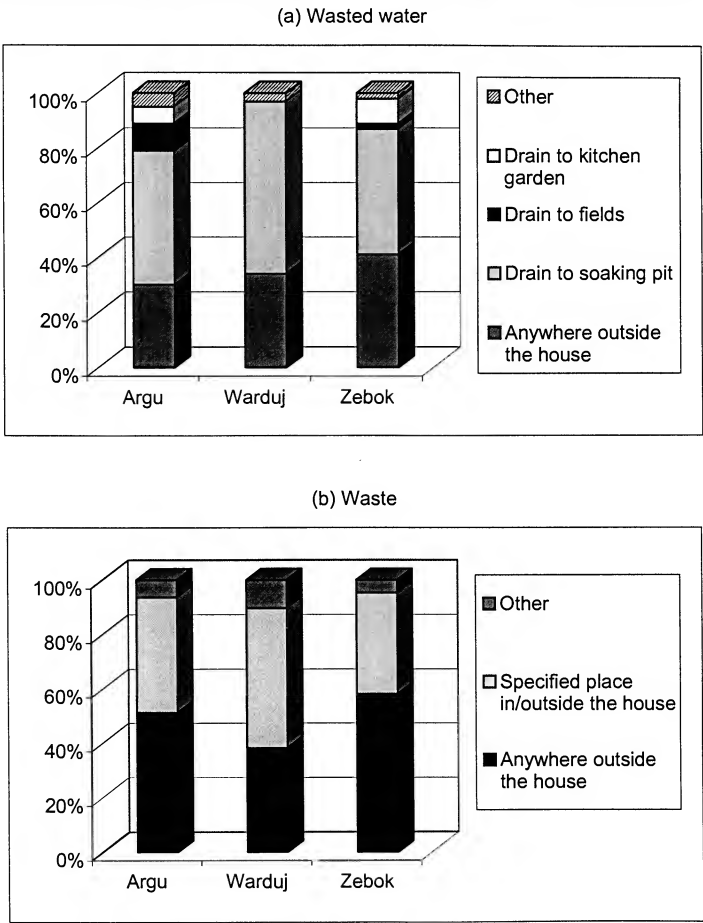
The same water sources, discussed above, also serve as sources for animals. In Warduj, 62% of the respondents reported that they take their animals to the water sources they themselves use. This behaviour concerns a smaller share of the population in Zebok, 40%, and in Argu, 34%. On the other hand, Table 19 shows that some households take their animals to the springs. This implies that the water downstream used by other villagers is dirty, despite respondents insistence otherwise.

Table 19: Percentage of Households Sharing their Drinking Water Source with Animals

	Argu	Warduj	Zebok
% of households sharing drinking water source with animals	34	62	40
% sharing spring	8	19	31
% sharing river/stream	26	40	9
% sharing canal	/	3	/

How households dispose off domestic waste and water used for cooking, washing and cleaning is a good indicator of sanitary practices. Figure 9(a) shows that 16% of the households in Argu, 11% in Zebok and none in Warduj recycle wasted water for the kitchen gardens or the fields. A large share of the households drain used water to a soaking pit. The fact that the remaining 30% to 40% of the population pour water anywhere outside the house suggests lack of knowledge about sanitation and environmental issues among the population. The same conclusion follows from Figure 9(b) where 57% of the households surveyed in Zebok, 51% in Argu and 38% in Warduj throw waste in the vicinity.

Figure 9: Frequency Distribution by Use of Household Products after Consumption



Note: the category other includes the following answers, in the river and not specified.

The last indicator about sanitation is access to latrine. Of the total sampled population, 33% of the households do not have access to latrines. Table 20 shows that the situation differs between districts as well as villages. In some areas of Zebok, up to half the population lives without latrine. Warduj district stands in hardly better situation. Argu district is characterised by high disparities, which brings the conclusion that, overall, in all the areas covered by the survey, not many households have access to latrines.

Table 20: Percentage of Households Not Having Access to Latrine

District	% of the sample population not having access to latrine		
	In the whole district	Maximum in the district	Minimum in the district
Argu	17.5	43.7	7.4
Warduj	42.6	46.7	35
Zebok	45.4	50	41.7

PART III. AGRICULTURE

3.1 Agrarian Systems

3.1.1 Farm Size and its Distribution

Farm size is a fundamental factor affecting farmers ability to increase agricultural production. Table 21(a) (b), (c) and (d) shows the mean area operated, owned, sharecropped and rented by households in the three districts. It is apparent that larger households operate larger size of land. In Argu, for example, households with more than 14 persons operate on the average 54 jeribs land compared to 19 jeribs for households with less than 6 members. The same explanation holds for Warduj and Zebok as well where farm size tends to increase with an increase in household size. A statistical test was run to see if the difference in the mean area operated between household size groups is different. The result shows that the difference is statistically significant in Warduj only; there is greater homogeneity between the households in Argu and Zebok.

There are few large owners in Argu that own in excess of 100.jeribs. In fact, the maximum area owned there is 100 jeribs. Warduj too has its share of large landowners as well; the maximum area owned is in excess of 100 jeribs; in Zebok, it stands at 79 jeribs. The mean area owned is 18 jeribs in Argu and 11 jeribs in Warduj. By contrast, the maximum area owned in Zebok is 11 jeribs with a mean of about 7 jeribs.

Larger households also sharecrop larger areas. Because of their command over large labour, large households are able to operate their own lands while at the same time sharecrop to improve their food security. In Argu, for example, the area sharecropped by households >14 persons is about five times more than that sharecropped by households of <6 persons. Renting out land is not so common, except in Argu where all household size groups are engaged in renting. But in real terms the area rented out is very small.

Table 21: The Distribution of Farm Land (Jeribs)

*(a) Mean area operated by households**

District	Measure	Household Size				Overall	Maximum	F. Significance
		3 - 6	6.1-10	10.1-14	>14			
Argu	Mean	18.85	32.98	37.65	53.5	32.96	100	n.s.
	S. Dev.	20.35	34.83	35.00	34.31	32.97		
	No. of HHs	17	32	17	9	75		
Warduj	Mean	10.45	12.50	29.02	34.94	17.20	105	0.000
	S. Dev.	8.93	12.92	30.58	33.67	20.87		
	No. of HHs	21	24	10	9	64		
Zebok	Mean	2.98	4.78	8.54	15.30	8.82	74	n.s.
	S. Dev.	1.49	3.42	5.85	26.35	15.64		
	No. of HHs	6	12	11	14	43		

*(b) Mean area owned by households**

District	Measure	Household Size				Overall	Maximum	F Significance
		3 – 6	7 – 10	11 – 14	>14			
Argu	Mean	10.6	18.15	27.87	27.12	18.46	100	n.s.
	S. Dev.	13.44	21.97	25.61	20.3	21.27		
	No. HHs	17	32	17	9	75		
Warduj	Mean	6.81	8.68	20.4	24.0	11.54	105	0.01
	S. Dev.	5.23	10.63	32.1	24.1	17.33		
	No. HHs	21	24	10	9	64		
Zebok	Mean	2.33	3.88	6.81	11.51	6.83	79	n.s.
	S. Dev.	1.16	2.90	4.60	19.93	11.83		
	No. HHs	6	12	11	14	43		

*(c) Mean area sharecropped by households**

District	Measure	Household Size				Overall	Maximum	F Significance
		3 – 6	7 – 10	11 – 14	>14			
Argu	Mean	2.60	5.38	7.59	10.87	5.81	60	n.s.
	S. Dev.	3.72	11.75	16.05	15.48	12.06		
Warduj	Mean	0.45	0.32	1.16	1.41	0.63	5	n.s.
	S. Dev.	1.33	0.84	1.96	1.87	1.39		
Zebok	Mean	0.0	0.0	0.0	0.36	0.11	3	n.s.
	S. Dev.	0.0	0.0	0.0	0.86	0.50		

(d) Mean area rented out by households*

District	Measure	Household Size				Overall	Maximum	F Significance
		3 – 6	7 – 10	11 – 14	>14			
Argu	Mean	0.5	0.26	0	0.5	0.28	9	n.s.
	S. Dev.	1.43	1.54	0	1.4	1.31		
	No. HHs	17						
Warduj	Mean	0.0	0.0	0.55	0.0	0.07	25	0.00
	S. Dev.	0.0	0.0	1.10	0.0	0.43		
	No. HHs							
Zebok	Mean	0.0	0.0	0.0	0.0	0.0	0.0	n.a.
	S. Dev.	0.0	0.0	0.0	0.0	0.0		
	No. HHs							

* Includes owned plus area sharecropped (rainfed and irrigated)

3.1.2 Land Tenure

The system of land tenure in all the districts is essentially the same. It is a mixture of private ownership and sharecropping, but the mix varies between the districts. There are not many landless households. The proportion of area cultivated by owners and sharecroppers is shown in Table 22. The data suggest that 76% of the households in Zebok are owners and cultivate 95% of the total area. The proportion of owner-cum-sharecroppers and sharecroppers proper is, therefore, very low relative to the proportion in Argu and Warduj. In Argu, owner-cum-sharecroppers and sharecroppers account for about 54% but cultivate 41% of the area. Warduj has by far the largest proportion of owner-cum-sharecroppers that account for over 36% and cultivate 36% of the total area.

Table 22: Percentage of Total Area Operated by Farm Status (Percentage)

	Owner		Owner-cum-Share		Sharecropper	
	Area	Households	Area	Households	Area	Households
Argu	59.1	46.1	19.4	25.0	21.5	28.9
Warduj	62.1	57.8	33.1	35.9	4.8	6.3
Zebok	94.8	75.5	3.5	17.8	1.7	6.7

Tenancy arrangements do not show much variation between the districts. The common system is that the landlord provides all the seed and fertiliser. The sharecropper contributes labour and oxen to plough the land, weed, irrigate, harvest and thresh the crop. Two-third of the output goes to the landlord and a third to the sharecropper.

There are circumstances in which poor farmers accept very oppressive contracts in which the landlord contributes 50% of the seed and fertiliser and leaves the rest for the tenant but still claims two-third of the harvest. High rental shares may probably work as a disincentive to the sharecropper to increase agricultural production.

3.2 Cropping Pattern

3.2.1 Land Allocation between Crops

Table 23 provides information on the proportion of land allocated to various crops, fruit and vegetables. It also indicates that there is an important difference in the cropping pattern between and within the districts. Wheat is by far the most important crop grown in all the districts, particularly in Argu and Warduj; it accounts for 56 percent in Argu and 49 percent in Warduj. The proportion of area allocated to this crop in Zebok is less than a third of the total cropped area. Wheat area in Argu and Warduj is high, because the average land holding there is relatively high and much of it is also irrigated, particularly in Warduj.

Table 23: Allocation of Agricultural Land (percentage cropped area)

Crop	District		
	Argu	Warduj	Zebok
Wheat	56.1	49.0	28.5
Rice	0.0	0.002	0.0
Maize	0.56	0.80	0.3
Barley	2.0	5.88	20.6
Chickpea	7.0	1.73	8.5
Vegetable	0.2	0.03	0.0
Clover	0.02	0.0	0.3
Fruit	0.0	0.86	0.0
Forest tree	0.02	0.0	0.0
Poppy	1.0	0.0	0.0
Total	66.9	58.3	58.2

Following wheat, barley and chickpea are the two most important crops grown. Farmers do not seem to value maize for its food. Despite being the second cereal crop in Afghanistan, maize in Badakhshan occupies a tiny proportion of the area cropped in a season. Given the short growing season, maize could have helped to ease the food shortage in the lean months. Rice is the staple grain but it is not cultivated, owing to its high water demand.

Besides the cereals, farmers also grow some fruit and vegetable, but these occupy a tiny proportion of the cropped land.

The overall intensity of land use is very low in all the districts. The highest is in Argu where just over two-third of the land is intensively used in a season.

3.2.2 Land Allocation between Crops by Farm Size

Production is primarily for household consumption, not for sale. Table 24 shows the different crops planted by farm size. The data suggest that wheat is more important for small farmers. However, large farmers also allocate, in real terms, more land to this staple crop. Maize is cropped by small farmers only, presumably because it is regarded as an “inferior” crop by the well-off. Barley and chickpeas are also grown as secondary crops, but mostly by the “middle” and “large” farm size groups. However, large farm size groups are less efficient than small farm groups in using the land efficiently; the land they cultivate in a season, as a proportion of the total land they command, is very low.

Besides the major staples, farmers also grow some fruit for household consumption and for sale. Apple, mulberry, peach walnut, apricot and pistachio are the major fruit varieties. Cheery, plum and mulberry are largely grown in Warduj. The average number of trees per household is the highest in Warduj where the valley is ideally suited to growing fruit. Overall, however, the number of trees per household is not comparable to fruit growing districts like Chak in Wardak. In neither district do farmers maintain orchards; often fruit trees are planted along the ridges so that they don’t compete with staple grains for land.

Table 24: Variation in Cropping Pattern between Farm Sizes (in percent)

(a) Argu

Farm size	No of households	Wheat	Maize	Barley	Chickpea	Fruit tree
<15	34.0	48.6	1.5	4.0	3.2	1.8
15.1-30	15.0	57.3	0.0	1.8	2.5	0.8
30.1-45	13.0	54.0	0.6	1.5	5.7	3.7
45.1-60	4.0	54.0	0.0	3.1	3.7	5.0
>60	5.0	53.8	0.0	1.1	0.0	4.0

1.3 Sampling Method

A stratified sampling method was used for the selection of sample villages and households. It is a two-stage sampling procedure in which villages were selected, first, based on distance from the main road and, then, on “VO status”. Using the first criterion villages were classified according to their distance from the main road, i.e. villages “close” to the main road and villages “far” from the main road, as defined by local informants. Villages located at a distance, less than 1hour walk from the district are classified as close and those farthest as far. Within these two strata, the villages are reclassified according to their VO status, that is, villages “with” and “without” Village Organisations. A total of four villages were selected from each district; two from each sub-strata. Figure 1 and Table 1 depict the application of this methodology.

A systematic random sampling method was applied to select households. First, a list of the households for each village selected was prepared along with their access to land. The households were then arranged in descending order on the basis of the variable “size of area owned”. Then proper units from the list (every N/n unit, where N= total number of households in the village, n = sample size) were selected randomly. If a sample household head could not be contacted, his replacement was randomly selected out of the farmers having similar farm size in the village.

The sample size in each village was determined by applying the following formula:

$$Y=8+0.1X$$

Where

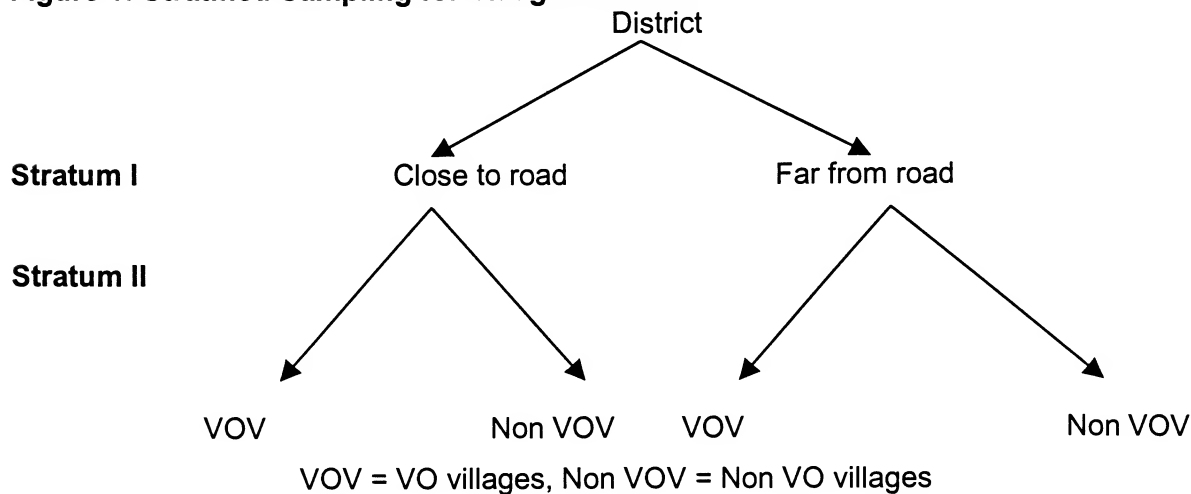
And

Y = size of the sample in a particular village

X = the total number of households in that village

Following the sampling procedure described above a total of 192 household heads, 80 from Argu, 68 from Warduj and 44 from Zebok were interviewed. The survey was implemented by the MRU Senior Surveyor, the late Dr. Farrouq and the Information Officer, Shahpoor, supported by CD staff in the field. The survey was implemented between 24th November and 21st December 1999.

Figure 1: Stratified Sampling for Village Selection



(b) Warduj

Farm size	No of households	Wheat	Maize	Barley	Chickpea	Fruit tree
<5	25.0	68.0	3.4	14.4	0.0	9.0
5.1-10	17.0	65.6	2.0	9.0	1.6	22.0
10.1-15	8.0	62.0	0.0	6.6	1.1	14.0
15.1-20	3.0	81.0	0.9	7.6	5.7	39.0
20.1-25	5.0	47.0	0.5	2.8	5.6	109.0
>25	4.0	35.6	0.0	5.1	1.3	43.0

(c) Zebok

Farm size	No of households	Wheat	Maize	Barley	Chickpea	Fruit tree
<3	27.0	28.2	29.0	32.0	7.8	0.0
3.1-7	16.0	25.7	0.0	36.0	6.8	1.5
7.1-11	4.0	22.5	0.0	22.5	16.8	4
>11	3.0	23.0	0.0	21.0	4.6	10

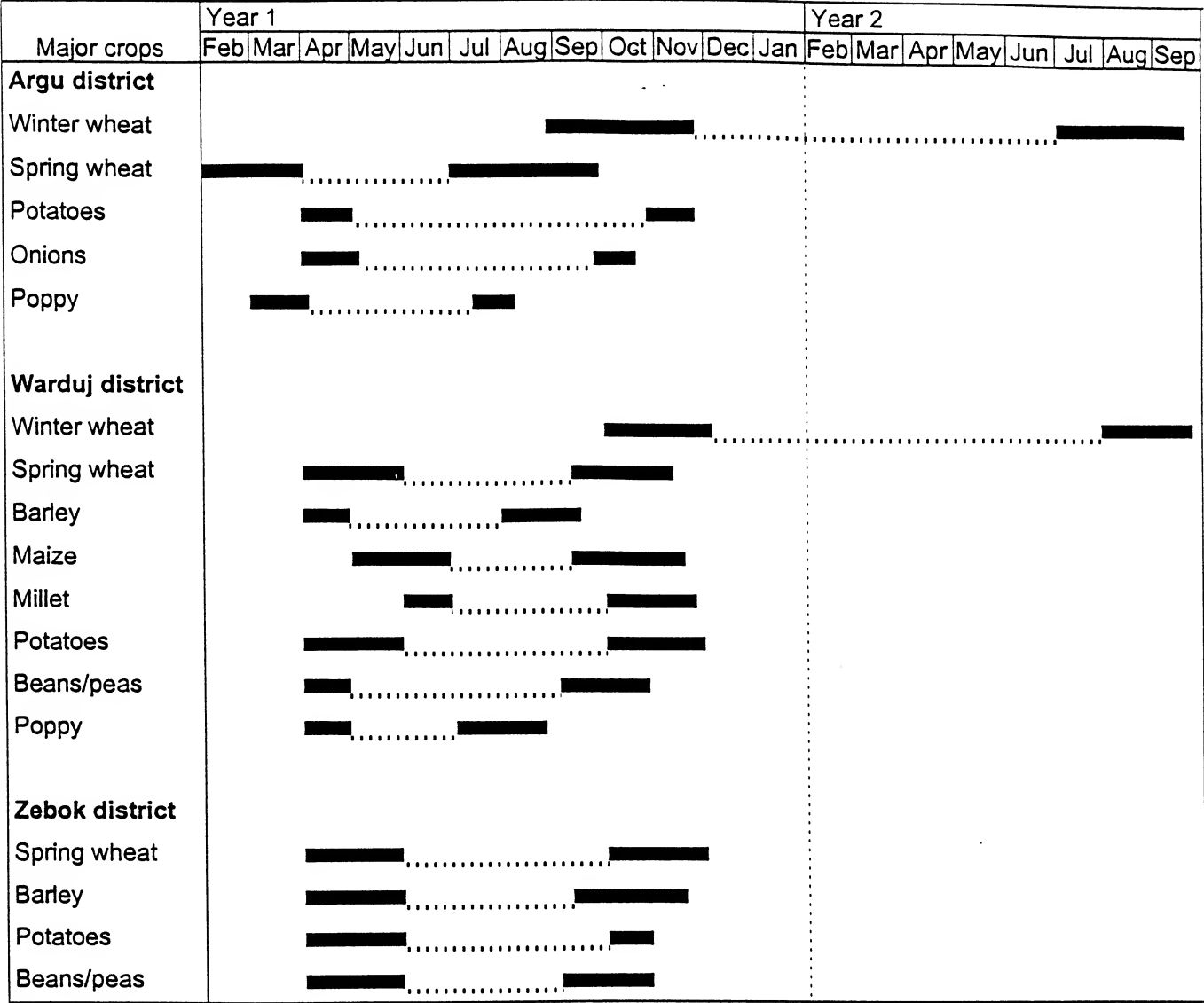
3.2.3 Seasonal Calendar

Figure 10 represents the seasonal calendar for the major crops grown in each district. There are two parts shaded in each row. The left shade shows the land preparation and plantation period, and the right shade, the harvest period.

The principal crops grown in each districts differ. They are, for example, less diversified in Zebok than in the two other districts. Winter wheat is not cultivated at all, and all the crops adopted follow the same planting and harvesting schedule. Therefore, the bulk of the agricultural activity is concentrated in 7 to 8 months of the year. It also appears that the season starts earlier in Argu than in Warduj as far as spring wheat and poppy are concerned. Potato and barley planting and harvesting seasons are similar, regardless of the district where they are grown. The seasonal calendar shows that the agricultural activity in Argu is more evenly distributed over the year.

In addition, several varieties of fruits are produced in Argu district: apricot, cherry, walnut and peach. The seasonal calendar concerning fruit trees does not appear in Figure 10 and is as follows: planting in March, budding in June-July-September and pruning in February-March of the second year.

Figure 10: Crop Seasonal Calendar



3.2.4 Crop Rotation

Crop rotation is commonly practiced in the districts surveyed. 91% of the sampled population rotate crops in Argu, 88% in Warduj and 100% in Zebok. Practices differ between irrigated and rainfed land. As the crops grown differ according to the type of land and, the practice of crop rotation is also different. The use of crop rotation as an index of land use intensity is presented in Table 25.

Table 25: Population Practicing Crop Rotation

	Argu	Warduj	Zebok
No of persons interviewed	80	68	44
No of persons rotating crops on irrigated land	60	59	44
No of persons rotating crops on rainfed land	60	40	2

The data suggest that most farmers in Argu and Warduj districts practice crop rotation on irrigated as well as on rainfed land. In Zebok, crop rotation is practiced by all respondents on irrigated land whereas only two farmers practice this on rainfed land.

According to the crops they cultivate, farmers have adopted different sequencing. For the main crops grown on irrigated land in each district, the crop rotation sequences are as follows. The percentages indicate the share of the sampled population rotating crops on irrigated land.

Argu	wheat- poppy- wheat	37%
	wheat- fallow- wheat	13.5%
	wheat- vegetables- wheat	13.5%
	poppy- wheat- poppy	13.5%
	poppy- poppy	13.5%
Warduj	wheat- barley- wheat	50%
	wheat- maize- wheat	21%
	wheat- wheat	19%
Zebok	wheat- fallow- wheat	26%
	wheat- barley- wheat	26%
	wheat- beans- wheat	17%
	wheat- chickling peas- wheat	15%

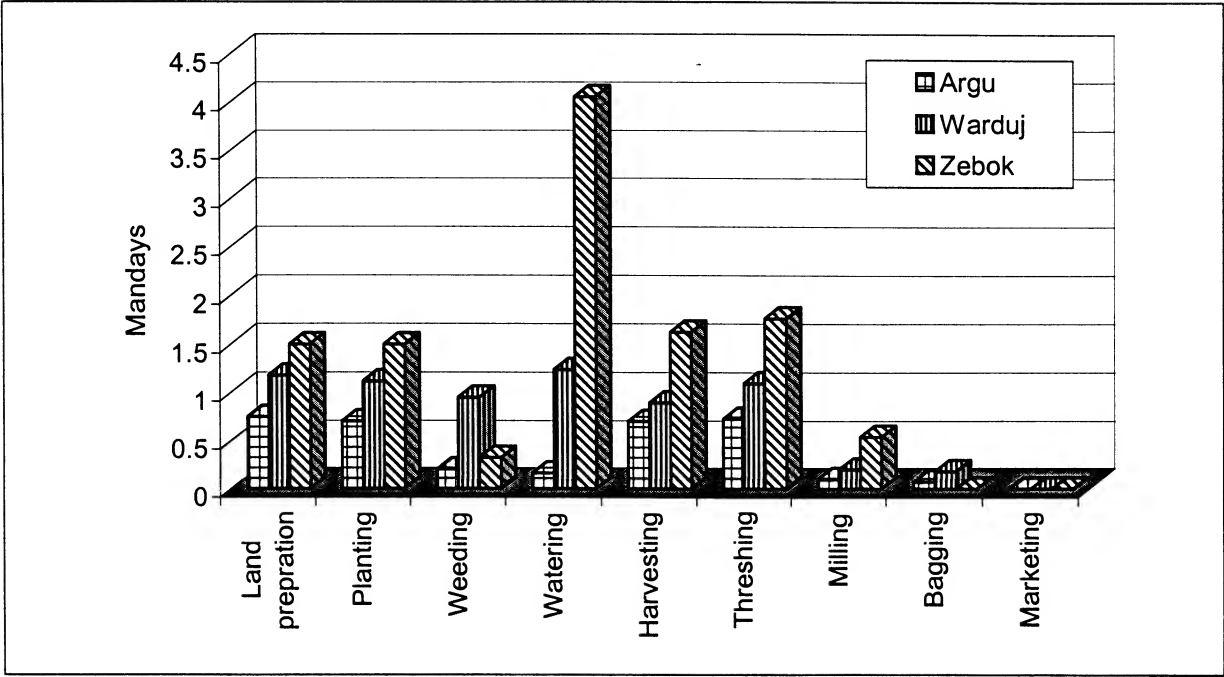
Crop rotation on rainfed land is standard for Argu and Warduj. Farmers cultivate spring wheat and winter wheat – see Figure 10 seasonal calendar- in between which they allow land to lie fallow.

3.3 Input Management

3.3.1 Labour Use

Figure 11 presents labour use by activity in the three districts. The data are for area cropped with wheat. Family labour, both male and female, and hired labour are summed up and presented in mandays per jerib.

Figure 11: Labour Use for Wheat by Activity

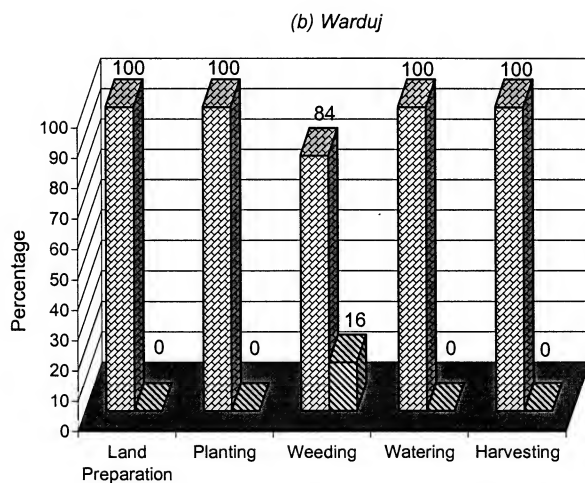
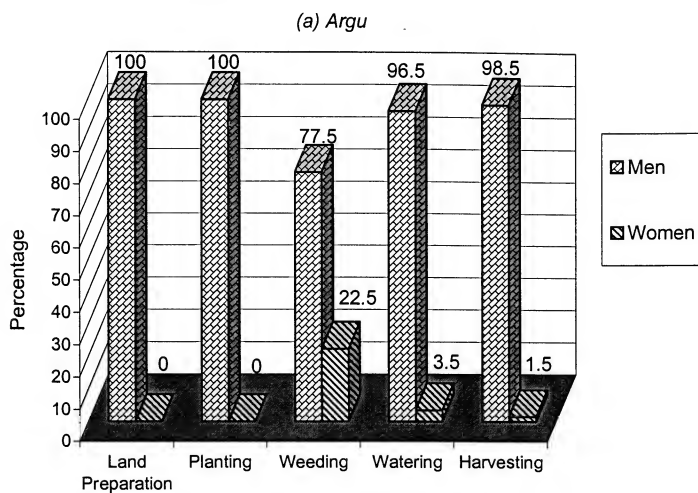


Land preparation takes longer in Zebok than in the other two districts. Land preparation involves breaking up the soil twice, if possible with oxen. Then, seeds are sown and covered with soil. This too is done with oxen, once for winter wheat and once for spring wheat. Watering is another major activity that is labour intensive, particularly in Zebok. It is noticeable that all the other activities are also more labour demanding in Zebok than in the other two districts. Harvesting is done by hand and threshing is left to local devices in which the harvested wheat is spread on the ground and systematically trampled by oxen and people.

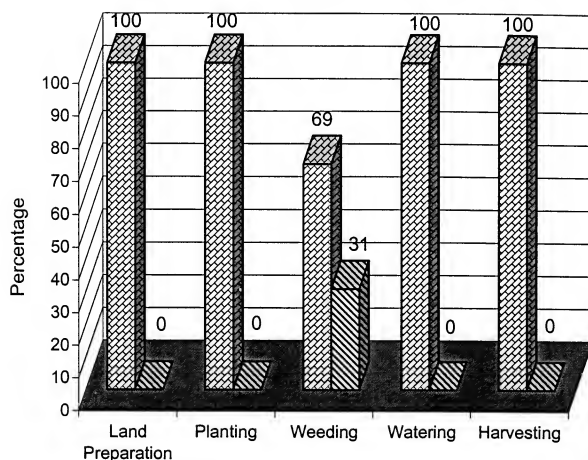
The lack of labour-saving machinery explains the excessive time input per jerib. The only help to the farmer is in the form of oxen. The final stages of cropping like milling, bagging and marketing take up very little time. Much of the crop is for home consumption; whatever surplus is left would be sold locally.

The contribution of women to the overall process is minimal, as can be seen from Figure 12. The men in the family do most of the agricultural work; only a tiny proportion of the work is attributed to the women in the household. If, on rare occasions, extra labour is needed, men might be hired. The data don't, however, reflect the contribution of women to agricultural activities. Many women were seen working in the fields, particularly in the peak labour demanding seasons, and much of the work is also done inside the compound. It is possible that tribal custom and male pride encourage the men to claim much of the credit for agricultural work while playing down the role of the women. In any case, a large proportion of work done by women is 'invisible' and goes unacknowledged.

Figure 12: Labour Use for Wheat by Gender



(c) Zebok

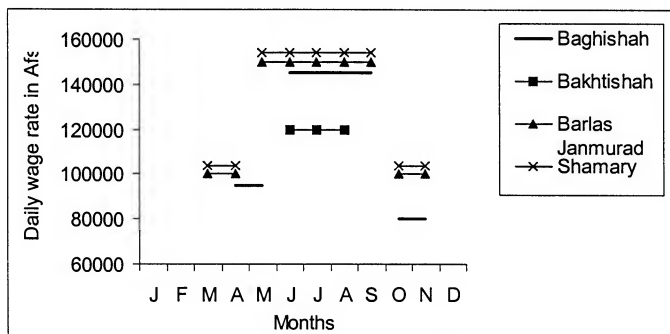


3.3.2 Seasonality of Demand for Labour

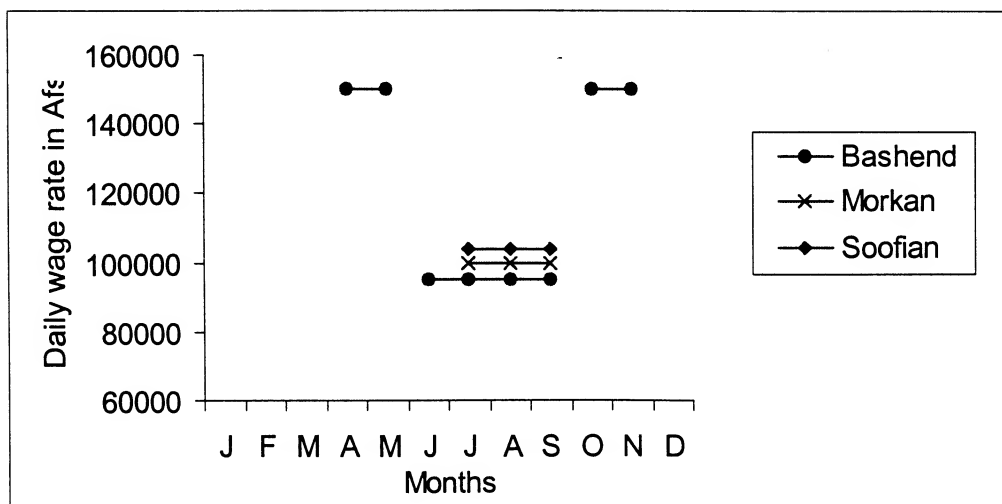
Demand for labour is subject to agricultural activity; therefore, it follows the seasonal crop calendar. During the planting, weeding and harvesting seasons, the demand for labour is high and wages increase. In wintertime, work is scarce and agricultural work related to crops is not any more a source of income for farmers. Figure 13 shows the seasonality of demand for labour in the village where agricultural work constitutes a source of income.

Figure 13: Seasonality of Demand for Labour and Daily Wage Rates in Afs

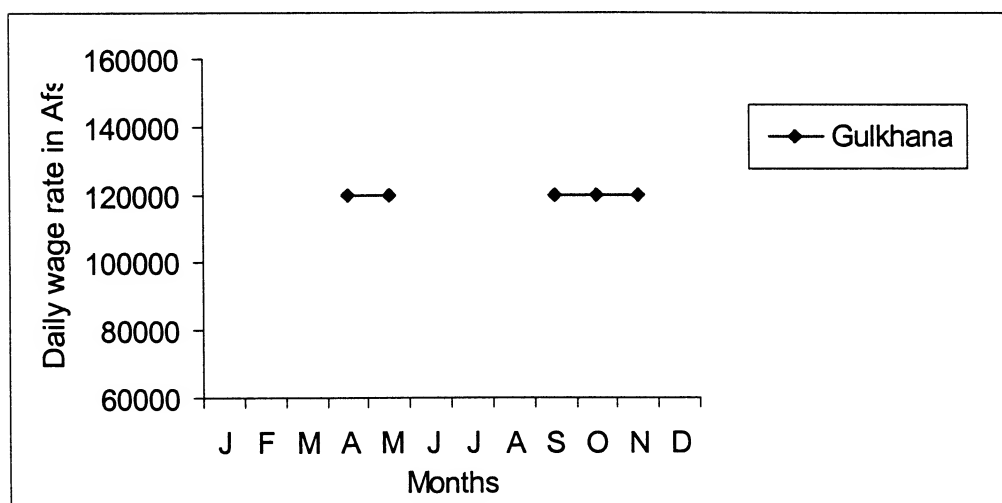
(a) Argu



(b) Warduj



(c) Zebok



The wage derived from agricultural work in the peak season is quite similar in all the districts; it ranges from 100,000 to 150,000 Afghanis per day. On the contrary, the peak and slack seasons for labour demand differ from district to district and even from village to village. The peak season can last from 2 to 8 months, according to the village.

In the 4 villages not presented in Figure 13– Rukhshan from Warduj and Khulkhan, Kolahla and Redkhod from Zebok- agricultural work is collective and does not involve wages as such. In Redkhod labourers are paid in kind, 14 kg of wheat per day during the months of September and October. In the other 3 villages, labour demand also follows the crop seasonality but workers are not paid wages.

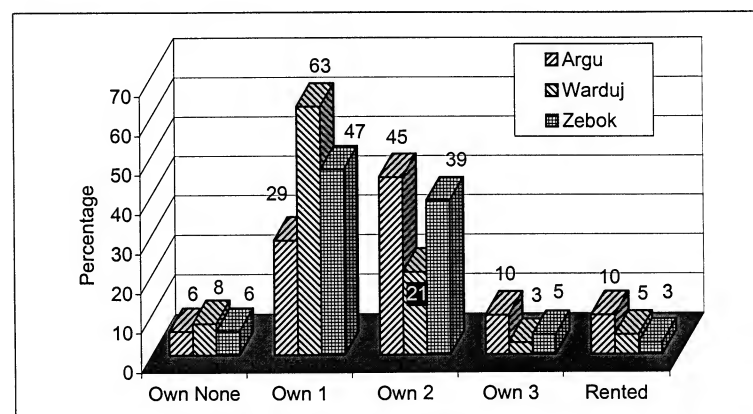
3.3.3 Farm Power

None of the sampled households own modern farm equipment, sprays, farm vehicles, tractors, ploughs and other improved implements. All the households surveyed depend on animal traction in

labour-intensive tasks, such as land preparation and threshing of wheat. Sowing, weeding and harvesting are all done by hand. Figure 14 depicts the distribution of oxen among the sampled households. In Warduj, over 60 percent of the households owned one oxen, while the figure for Argu and Zebok is, respectively, 29 percent and 47 percent. About 45 percent of the households in Argu, 39 percent in Zebok and 21 percent in Warduj own two oxen. Not many households own more than three oxen – the highest percentage, about 10 percent, is in Argu.

Since agricultural activities are arduous, farmers are willing to invest on oxen to ease the burden. However, keeping even an ox is expensive as its upkeep can strain the budget of a household. Hence, renting is an alternative, though costly still. It is particularly attractive for resource poor households. Renting is relatively common in Argu than in the other two districts.

Figure 14: Percentage of Households with Access to Farm Power (oxen)



3.3.4 Seed and Fertilizer Application

Data presented in Table 26 show a clear difference between the districts in the proportion as well as the types of fertilizer applied. In Argu, a high proportion of farmers have applied chemical fertilizer: 40% have applied DAP, 76% urea against 24% who applied animal manure. The corresponding percentages for Warduj are relatively low but still significant when compared with Zebok. In Zebok, farmers hardly apply chemical fertilizer even on the local varieties; about 72% of the farmers applied manure as opposed to 18% who apply DAP and urea.

Another observation is that most farmers seem to apply chemical fertilizer on improved seed varieties. In Argu, 49% of the farmers have applied DAP and urea on improved varieties against 23% in Warduj and 15% in Zebok. Chemical fertilizer is applied on local seed varieties by a relatively large proportion of farmers in Argu and to some extent in Warduj.

Land productivity could be increased by management practices as well as inputs amongst which fertilizer application is the critical one. However, the actual fertilizer dosage per unit of land is low in all the districts. The highest dosage was observed in Warduj where farmers have applied a mixture of urea and DAP at the rate of 47kg/jerib compared to 39kg/jerib in Argu. However, the dosage per jerib on local varieties remains very low in Warduj as well as in the other districts.

Table 26: Fertilizer Application on Wheat (Percentage of those applying)

	Argu	Warduj	Zebok
Applying DAP	40.0	24.6	0.0
Applying Urea	76.0	35.4	2.6
Applying local ertilizer	24.0	53.8	71.8
Applying on improved variety (DAP & urea)	49.3	23.1	15.4
Applying on local variety (DAP & urea)	66.7	36.9	2.6
Average dose of Urea & DAP (kg/jerib):			
on improved variety	39.4	47.5	46.7
on local variety	13.8	4.9	15.0

3.3.5 Irrigation Intensity

Table 27 presents the irrigation requirement and irrigation intensity for the main crops grown in all the districts.

Crops cultivated in Argu are irrigated fewer times than the crops in Warduj which further compares poorly with Zebok. It would seem that irrigation is not such a serious constraint in Zebok than in the other districts. On the contrary, the share of the population under-irrigating its land is the highest in Argu. Wheat in Argu needs to be irrigated at least 5 times and yet more than half the sampled population cannot fulfil this requirement. On the other hand, the standard deviations show that serious lack of irrigation affects more farmers in Zebok. The gap between the number of times a crop should be irrigated and the number of times it is effectively irrigated tends to vary more in Zebok. It means that some farmers irrigate their land fewer times that what is culturally regarded as the optimum.

Fruit trees require relatively more water but there is almost no under-irrigation Out of the 11 respondents, only 1 farmer (corresponding to 9%) did not irrigate sufficiently.

Table 27: Irrigation Intensity

District	Variety	Average no of times needs irrigation (Optimum)	Average no of times irrigated (Practice)	St. Dev	No of respondents growing the crop on irrigated land	% of this population under-irrigating the crop
Argu	Wheat	5	4	1.3	35	54
	Potato	7	6.5	1.8	20	25
	Poppy	4	3.5	1	48	29
Warduj	Wheat	9	8	2.6	57	21
	Barley	8	7	1.7	24	29
	fruit tree	13.5	13	5.4	11	9
Zebok	Wheat	11	10	4.5	37	16
	Barley	8.5	7.5	3	36	14

3.4 Land Status and Productivity

3.4.1 Yield Analysis

The impact of the input components and the corresponding outputs can also be read from Table 28. Farms that have applied chemical fertilisers in combination with local fertiliser (mostly manure) on improved seed varieties have achieved higher yield. Improved wheat yield in Argu ranged from 51 to 75 seers/jerib (Table 28), but over 60% of the farms have achieved less than 60 seers/jerib. In Warduj, 50% of the farms have obtained 56 seers/jerib. In Zebok, only 3 farms were planted with improved wheat seed varieties and the average yield was 47 seers/jerib. The local wheat seed variety accounts for at least 80% of the total seed planted in each district, some on rainfed fields but the bulk on irrigated fields. However, average yield of the local varieties is, in all the districts, well below the national average of 60 seers/jerib estimated by FAO. The yield is particularly low in Argu and Zebok. In Warduj, 19% of the farms have achieved 72.5% of the national average; 39.1% have achieved 65%. The rest have achieved less than 50% of the national average.

Table 1: Sampled Villages

Criteria	District/Village		
	Argu	Warduj	Zebok
Close to main road 1. VO village 2. Non VO village	Shahmary Baghishah	Morkan Bashend	Khulkhan Gulkhana
Far from main road 3. VO village 4. Non VO village	Bakhtishah Barlas Janmurad	Rukhshan Soofian	Redkhod Kolalha

1.4 Data Analysis and Report Writing

Owing to the volume of information collected and the unexpected death of the Senior Surveyor, data entry, analysis and report writing has taken longer time than anticipated. The report was finalised after a concerted effort was put in by the Monitoring and Research Unit staff in July and August. All the data were entered in databases created in “ACCESS”. The analysis was kept to the level of descriptive statistics and simple bar charts. However, instead of just defining averages, the analysis aimed at showing variations between households, farm sizes and districts in the general practices, resource acquisition and income distribution by running “mean” tests. Classifications by farm size and status, household size, etc. are meant to capture these variations in practices, resource acquisition and use, besides improving data organisation and presentation.

1.5 Report Structure

The report is organised in five major parts. Part I deals with the introduction, objectives of the study and methodological issues, including sample size selection and application of checklists and questionnaires. In Part II, the basic characteristics of the sampled population, including data on the composition of households classified by household size, age structure and labour force are presented. Part II is a general presentation of the population observed during the survey. It includes data on the composition of households with classification by household size, age structure and labour force, a review of schooling facilities and education level, and finally detailed information on health status and practices.

Part III is about agriculture, and it has four major sections. The first section deals with agrarian systems by looking into the distribution of land and the relationship between landlords and tenants. The allocation of land for different crops and the seasonality dimensions are dealt with in section two. In section three we look into the management of inputs and the intensity of their use. In section

Table 28: Productivity of Farms Growing Improved and Local Wheat Seed on Irrigated Land

<u>Improved Seed</u>							
Yield	Percent	Mean Yield	Average No	Seed Rate	Fertiliser Use (Kg/Jerib)		
Seer/jerib	of farms	Seer/Jerib	Irrigation	Kg/Jerib	DAP	Urea	Local
a) Argu							
< 50.0	22.7	55.9	2.6	32.5	1.7	16.7	0.0
60-80	22.7	50.7	4.0	32.7	21.4	31.8	0.0
90-150	18.2	60.0	4.0	32.9	22.1	23.4	4.7
180-300	22.7	58.1	5.4	28.2	14.2	22.2	12.2
>300	9.1	75.0	7.0	52.5	15.8	29.4	14.5
b) Warduj							
50-70	50	56.4	5.4	38.2	24.5	24.5	0.0
90-150	30	75.5	8.7	44.3	21.8	22.6	7.7
>150	20	71.4	10.0	43.4	21.5	27.7	20.0
c) Zebok							
<60	3 farms	46.7	12.0	46.7	46.7	46.7	26.7

<u>Local Seed</u>							
a) Argu							
<50	63.2	12.8	2.4	29.1	12.0	22.3	0.0
60-100	15.8	14.7	4.3	18.5	8.7	11.6	0.0
>100	21.0	9.9	5.8	21.2	2.8	8.9	4.8
b) Warduj							
<50	18.5	43.5	3.3	33.7	0.0	0.0	0.0
60-80	31.5	39.1	6.5	29.2	0.0	0.0	8.7
90-120	16.7	28.1	8.0	27.2	0.0	0.0	22.3
130-200	11.1	28.4	9.0	28.6	0.0	1.4	17.6
210-300	11.1	29.3	10.0	30.5	1.6	4.7	13.8
>300	11.1	23.7	12.6	28.1	3.3	5.4	13.8
c) Zebok							
<30	46.9	19.1	6.8	28.6	0.0	0.0	35.9
40-60	40.6	25.7	10.5	33.1	0.0	0.0	61.9
>60	12.5	28.0	18.8	32.5	0.0	3.5	50.0

Table 29 compares the mean yield from local and improved variety sown on both irrigated and rainfed land. The average yield obtained from improved variety sown on irrigated fields in Argu is 17 times higher than the local variety cropped on rainfed land and 7 times higher than that obtained from local variety but cropped on irrigated land. Equally high yield is obtained from improved seed varieties sown on irrigated fields in Warduj and Zebok. Although the average yield of improved seed varieties is higher than the average yield of the local varieties, only a small proportion – about 2% of the total wheat area in Argu, 31% in Warduj and 5% in Zebok - is planted with improved seed varieties on irrigated land. Maize, barley and potato are local varieties and yet their respective yield from irrigated fields is higher than from rainfed fields.

Table 29: Comparison of Mean Yield from Local and Improved Varieties (Kg/Jerib)

	Local Irrigated	Local Rainfed	Improved Irrigated
(a) Argu			
Wheat	71.1	28.1	473.0
Maize	222.4	56.0	NG
Barley	385	94.6	NG
Potato	1144.7	NG	NG
Poppy	9.6	NG	NG
(b) Warduj			
Wheat	199.1	31.8	473.4
Maize	369.4	NG	NG
Barley	204.9	87.5	NG
Potato	3645.8	NG	NG
Poppy	NG	NG	NG
(c) Zebok			
Wheat	174.6	28	326.7
Maize	25.0	NG	NG
Barley	183.8	NG	NG
Potato	403.0	NG	NG
Poppy	NG	NG	NG

NG means not grown

Irrigated land is scarce so farmers have to cultivate rainfed land. This inevitably leads to differences in yield between the two types of land. Taking wheat and barley yield as an index of land productivity, a statistical test was made to measure the yield difference between the irrigated and rainfed lands. A glance at the data (Table 30) reveals that the mean wheat yield per jerib is

significantly higher from irrigated land compared to the yield from the rainfed land in all the districts. In Warduj, the mean yield from irrigated fields is nearly 4 times greater than from rainfed land. Statistical tests reveal significant variation between the two land types. Mean barley yield is also significantly higher from the irrigated fields compared to the yield from the rainfed fields. Grain yield is directly linked to land status whose potential is affected by inputs, among which irrigation water is crucial.

Table 30: Mean Yield Per Jerib by Land Status (kg)

(a) *Wheat*

District	Overall Mean	Mean Rainfed	Mean Irrigated	F. Significance Level
Argu	143.3	111.0	394.0	0.001
Warduj	185.3	80.0	282.0	0.000
Zebok	143.2	90.0	145.0	0.000

(b) *Barley*

District	Overall Mean	Mean Rainfed	Mean Irrigated	F. Sign. Level
Argu	107	83	182	0.000
Warduj	227	75	261	0.001
Zebok	182	70	185	0.000

3.4.2 Poppy Cultivation

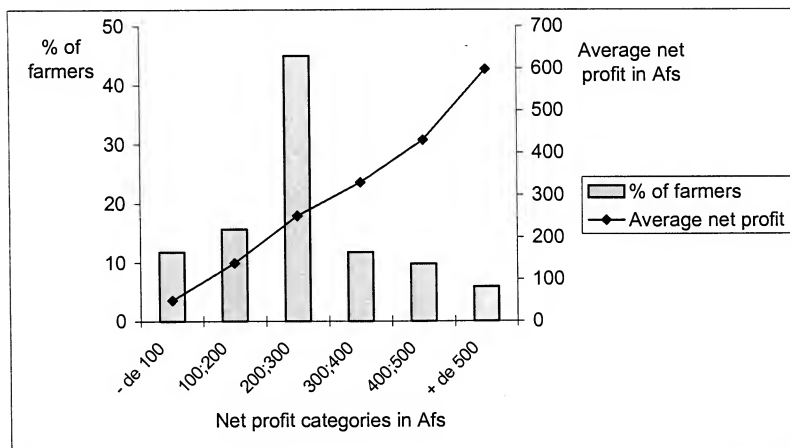
Poppy is not widely grown in Warduj and is non-existent in Zebok; it is mainly grown in Argu. This section therefore focus on poppy grown in Argu. The total area of irrigated land under poppy cultivation is approximately 280 jeribs (ie 56 hectares): 180 jeribs in Bakhtishah, 50 in Shamary, 40 in Baghishah, and less than 10 in Barlas Janmurad. Very little rainfed land is planted with poppy: around 10 jeribs in Shamary and even less in Bakhtishah.

A large share of the population adopts poppy cultivation. 60 farmers out of the 80 interviewed grow poppy. It represents 100% of the sampled population in Bakhtishah, 74% in Shamary, 69% in Baghishah and 50% in Barlas Janmurad,

The crop rotation sequences (see section 3.2.4) highlight the importance of poppy in the farming system. Wheat land is often allocated to poppy; around half the population which rotates crops, alternates wheat and poppy on the same land (wheat- poppy- wheat or poppy- wheat- poppy).

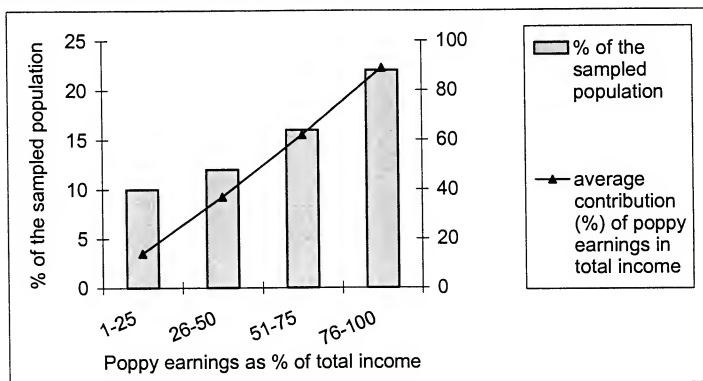
Poppy yield data are not available but respondents estimated the profit they make from this crop, and this is depicted in Figure 15.

Figure 15: Earnings from Poppy Cultivation per Jerib of Land



The sale of poppy accounts for 3% to 100% of the total household income, depending on the yield and the area cultivated. Figure 16 shows the contribution of poppy to the total household income. For more than 63% of the sampled population, it represents the principal source of income (more than half the households' budget). It is the only source of income for four of the sampled households. This explains why the households depend on this crop for their income. Therefore, understandably, half the respondents when asked under which conditions they would give up poppy cultivation simply answered that they would not.

Figure 16: Importance of Poppy as a Source of Income



3.4.3 Constraints to Agricultural Production

Agricultural activity is affected by natural factors such as the weather, soil quality, and area of arable land. In particular, a large share of the population is badly affected by climatic conditions: 90% of the sampled population in Argu, 92% in Warduj and 93% in Zebok. Table 31 shows the percentage of the population whose agricultural production is negatively affected by bad weather conditions.

Table 31: Percentage of the Sampled Population Affected by Weather Condition

Climatic factor	1st important climatic risk			2nd important climatic risk		
	Argu	Warduj	Zebok	Argu	Warduj	Zebok
Precipitation						
Late rain	49	45	28	29	28	22
Heavy rain/flood	34	17	15	21	11	6
Lack of rain	5	10	3	11	0	6
Heavy snow	2	12	13	0	33	11
Temperature: Frost	7	5	10	18	11	22
Strong wind	3	11	31	21	17	34

Since the climate differs from one district to another, the principal weather conditions hindering agricultural production also vary. Late rain is the first constraining factor and it affects production in all the districts. Heavy rains and floods are major problems in Argu where they are considered as the first important climatic risks by 34% of the respondents. Farmers in Warduj and Zebok districts also suffer from heavy snow. Strong wind mainly concerns farmers in Zebok.

The major direct implications of those climatic risks on the production are poor/no harvest, pests and diseases and to a lesser extent, poor germination. Out of the 192 households interviewed, 133 experience poor/no harvest, 105 pests and diseases and 45 poor germination. Table 32 shows the links between climatic factors and effects on farming output. The crosses measure the incidence of the climatic factors in terms of % respondents affected by the factors and experiencing the scourge:

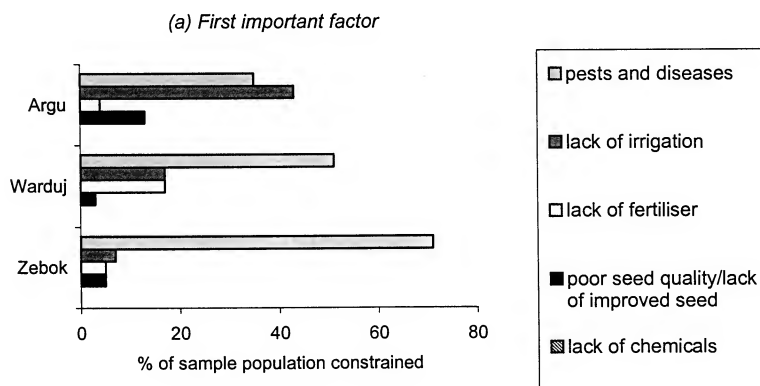
X]0;10]
X X]10;20]
X X X]20;30]
X X X X]30;40]
X X X X X]40;50]

Table 32: Incidence of Climatic Factors on Agricultural Production

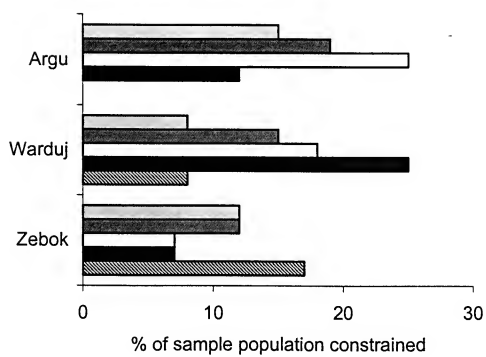
Climatic factor	Poor/no harvest	Pests and diseases	Poor germination
Late rain	X X X X X	X X X X	X X
Heavy rain/flood	X X X X	X X X X X	X
Lack of rain	X X X X	X X X X	X X X
Heavy snow	X X X X X	X X	X X X
Frost	X X X X X	X X	X X
Strong wind	X X X X X	X X X	X X X

In case of late rain, heavy snow and strong wind, the main result is poor or no harvest as experienced by 40 to 50% of the farmers. Pests and diseases arise most often from late rain, heavy rain or flood and lack of rain. Poor germination is less frequent outcome of bad weather conditions.

The other important factors limiting agricultural production are depicted in Figure 17, below. Pests and diseases affect farmers in all districts whereas lack of irrigation is a problem specific to Argu (see section 3.3.5). Other factors such as poor seed quality, lack of fertiliser and lack of chemicals, although hindering high and good production, are considered as less constraining than pests and diseases and the lack of irrigation.

Figure 17: Factors Limiting the Agricultural Production

(b) Second important factor



PART IV. THE LIVESTOCK ECONOMY

4.1 Herd Composition

Livestock has always been a very important component of the small farm economy in Afghanistan. Oxen cultivate the land; cows provide milk and dairy products. Sheep and goats provide food and are the most important source of household income. Sheep are also important in that they provide astrakhan pelts and wool for making carpets. Over the past twenty years, large number of animals were lost, both through the direct effects of the war and because farmers were compelled to sale them for cash to buy food (FAO, 1997) ¹ No reliable information is available about livestock composition before the conflict in the sample districts, but a rough estimate can be made using information derived from data reported by the Ministry of Planning in 1970 and comparing this with the survey. Data given in table 33 show that the ratio of sheep to goats has fallen from the 1970 level but still remains high in favour of sheep. The ratio of sheep to cattle and goats to cattle has decidedly changed in favour of the smallstock. There are now almost twice more sheep and goats than cattle, suggesting that farm households are in the process of rebuilding their depleted herd during the conflict years. Unlike cattle, sheep and goats forage on shrubs and trees (mainly goats) and reproduce very rapidly. The physiological and feeding pattern means that smallstock are very attractive to small farmers with limited capital and resources to rebuild their herd.

Table 33: Overall Ratios by Species

	<u>Argu</u>	<u>Warduj</u>	<u>Zebok</u>	<u>All Districts</u>
Sheep : Goats				
1970	n.a.	n.a.	n.a.	1.54
Survey	1.48	0.98	1.55	1.26
Sheep : Cattle				
1970	n.a.	n.a.	n.a.	2.24
Survey	3.31	5.30	5.81	4.73
Goats : Cattle				
1970	n.a.	n.a.	n.a.	1.46
Survey	2.24	5.41	3.77	3.77

n.a. means data not available

Source: Data for 1970 from Socio-economic Survey of Badakhshan, Volume – I, 1970

¹ FAO (1997) Afghanistan Agriculture Strategy, 1997

Another measure of the herd composition is presented in table 34. This index is derived by summing up the three species and then calculating the percentage of each species in the total herd. In Argu and Zebok, more than half the animals raised were sheep. In Warduj, sheep and goats account for about the same proportion in the total herd in the district. Overall, cattle account for less than a quarter of the herd in all the districts; sheep and goats constituted the largest proportion of animals raised by the people.

Overtime, however, the proportion of cattle has declined significantly while that of sheep is on the increase. This may be due to diminished grazing lands for cattle as well as the effects of the war. The strategy now appears to be keeping more smallstock. However, goats still account for a lesser proportion of the herd than in 1970.

Table 34: Percentage of Each Species in Total Herd

	Argu	Warduj	Zebok	All Districts
Cattle				
1970	n.a.	n.a.	n.a.	21.2
Survey	15.3	8.5	9.5	10.5
Sheep				
1970	n.a.	n.a.	n.a.	47.5
Survey	50.5	45.3	54.9	49.8
Goats				
1970	n.a.	n.a.	n.a.	47.8
Survey	34.2	46.2	35.7	39.7

Source: Data for 1970 as above

4.2 Distribution of Livestock

Livestock is a major source of employment, income and food for farm households, irrespective of their economic status in the agrarian system. Unless, constrained by resource shortage, like grazing land/pastures and farm labour to tend animals, all farm households raise a few goats and sheep and one or two cattle, for subsistence purposes. In all the districts surveyed, oxen remain the traditional source of farm power, but not many households own them.

The distribution of animals for the sample households is presented in table 35. The mean number of cattle and sheep per household is higher in Zebok than in Argu and Warduj. There are more goats per household in Warduj than in Argu and Zebok. Donkeys and horses are also important, particularly the former, for local transport and marketing agricultural products. Again the mean

number of donkeys is higher, just under 2, in Argu than in Warduj and Zebok. Farmers in Zebok also keep a large number of poultry. There are, however, a large number of households who have no animals at all in all the districts. Nearly two-thirds of the households in Argu do not own sheep. More than a third of the households in Argu and Warduj do not own, respectively, goats and sheep. By contrast, a large percentage of the households in Zebok own these species.

Table 35: The Distribution of Livestock Ownership

	Cattle	Sheep	Goats
Argu			
• Mean number per household	3.2	20.6	8.3
• Maximum number per household ¹	9	70	51
• Percentage of households with no animal ²	28.0	62.3	37.3
Warduj			
• Mean number per household	2.9	20.5	16.5
• Maximum number per household	8	130	110
• Percentage of households with no animal	15.3	35.4	18.5
Zebok			
• Mean number per household	3.5	21.1	13.4
• Maximum number per household	10	150	190
• Percentage of households with no animal	4.5	9.1	9.1

Other animals

	Donkey	Horse	Poultry
Argu			
• Mean number per household	1.8	1.5	5.4
• Maximum number per household	4	4	12
• Number of households with no animal	12.0	78.7	45.3
Warduj			
• Mean number per household	1.4	1.0	5.2
• Maximum number per household	3	1.0	20
• Number of households with no animal	29.2	96.9	40.0
Zebok			
• Mean number per household	1.6	1.6	22.3
• Maximum number per household	5	4	45
• Number of households with no animal	15.9	65.9	86.3

1. That is among those who own;
2. Calculated as a proportion of total sample households

four, yields of the major crops are estimated for different land types and at different intensity of input use in order to capture the productivity of the cropping sector.

Part IV provides quantitative information about the livestock economy. The composition of herds before and after the war is measured and their productivity is estimated after developing various indexes of “herd productivity”. Information is also provided regarding the major constraints to animal productivity – animal feed and diseases.

Finally, in Part V, we assess the livelihood security of different categories of households using various indexes. We look into the incomes and expenditure patterns, food security status of households, the seasonality of food deficit and that various coping mechanisms adopted by the people of Argu, Warduj and Zebok.

Relatively more households own donkeys than horses. In fact there are a few households who do not own horses. Again, relatively more households own one or two donkeys in Argu than in the other two districts; only 13% of the sampled households are non-owners in Argu. The average number of donkeys per household is high in Zebok than in Argu, however.

It is interesting to note that although poultry are free-range and require little capital, the extent of poverty is such that nearly half the population do not own any poultry at all. Among those who own, the average per household is the highest in Zebok, followed by Argu. There are no specialised commercial operators producing for the market at a large scale.

4.3 Livestock Productivity

Productivity can be expressed in many ways. One index of productivity is given by the ratio of female to male animals (table 36). The ratios clearly show that there are significantly more females than male animals of both cattle and smallstock in all the districts. Even the poultry ratios are biased in favour of hens. This is typical of dairy product driven (as opposed to beef producing) and subsistence oriented production system. The fact that there are more female than male animals suggests that farmers aim at maximising the number of animals and their output- milk in particular.

Table 36: Ratio of Female to Male Animal ¹

	Argu	Warduj	Zebok
Cattle, cow : ox	2.7	3.5	4.6
Sheep, ewe : ram	12.4	4.4	2.1
Goat, female : male	6.4	6.5	2.9
Poultry, hen : cock	5.0	3.0	2.9

Another index of productivity is given by the data in table 37. The ratio of calves to cows is essentially the same in all the districts, but there are significant differences in the ratios of both sheep and goats between the districts and the species. There are relatively fewer immature sheep and goats in Argu, while the ratios for Warduj and Zebok are not far from unity. Overall, there are fewer number of immature smallstock in all the districts suggesting that, after parturition, farmers keep only those needed for breeding.

The performance of animals is very much a management question, but weather and grazing conditions also play a significant role. The milk yield of cattle calculated for the average lactation period would be 340 litres in Argu, 209 litres in Warduj and 168 litres in Zebok district. Goats and sheep also produce some milk and wool. However, milk is not sold but consumed at the farm. Male

smallstock are sold when cash is needed to purchase food items or cover incidental expenses and slaughtered during religious festive.

Table 37: Index of Livestock Productivity

	Argu	Warduj	Zebok
Ratio of calf : cow	0.58	0.56	0.55
Average lactation period (month)	7.4	7.4	6.3
Average milk/cow/day (litre)	1.53	0.94	0.89
Ratio of immature : female sheep ¹	0.46	0.78	0.69
Average lactation period (month)	3.71	3.69	3.94
Average milk/sheep/day (litre)	0.21	0.34	0.21
Ratio of immature : female goat	0.50	0.73	0.75
Average lactation period (month)	4.24	4.04	3.54
Average milk/goat/day (litre)	0.29	0.35	0.26
Annual wool production (kg/sheep) ²	0.36	0.61	0.49
Annual wool production (kg/goat)	0.35	0.44	0.32
Average egg production (no/hen)	46.7	53.9	64.1

¹ Only mature female sheep and goats are considered in deriving the ratio

² Productivity of mature male and female smallstock

4.4 Constraints to Livestock Production

4.4.1 Animal Feed

Livestock production in all the districts largely depends on grazing, but not much area is suitable for grazing. Supplementary feeding with fresh fodder crops, hay from pastures or fodder crops, agricultural by-products during periods of scarcity is common in all the villages. Supplementary feeding is necessary and important especially during the winter months where livestock are fed indoor. In the warmer months, livestock remain outside. March is the main feed deficit month, as shown in Figure 18. It is spring season and fields are waterlogged. The survey indicates that total available feed during these deficit months is probably the main factor limiting animal productivity. Fodder is normally collected from the farms but since many households do not produce enough fodder they buy for the deficit months. Indeed demand for feed is very high in all the villages surveyed.

Figure 18: Acute Feed Shortage Months, Frequency of Responses

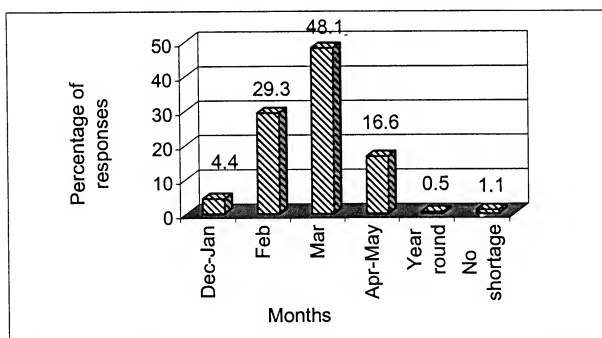


Figure 19: Ways of Overcoming Feed Shortage, Frequency of Responses

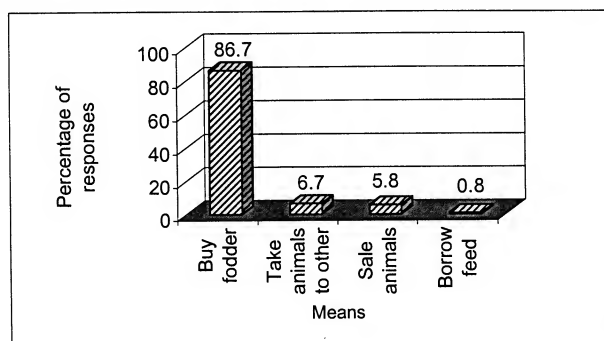


Figure 19 clearly indicates that over 90% of the responses to feed-deficit was to buy fodder. The next most important means of overcoming feed-deficit is to take animals to other locations (transhumance) where pastures are thought to be available. Some households are also compelled to sell their animals rather than see them lose weight and value and even die. The promotion of fodder crops appears to be an attractive proposition as most farmers grow some alfalfa, but this is usually done in competition with other field crops. The individual farmer makes the final decision about the scale of fodder crop production but it is also critical that the importance of fodder crops for the development of livestock production is duly considered.

The strategy of keeping more smallstock than cattle is in part a response to feed shortage. Goats in particular adapt to feed shortage easily as they forage on shrubs and tree leaves. Cattle, by contrast, depend on grass, and due to shortage of grazing pastures, they account for a tiny proportion of the total herd and, even then, most of them are milking cows or heifers normally kept in the farm vicinity and stable fed.

4.4.2 Animal Mortality

Neo-natal mortality rates are higher in sheep and goat than in cattle (table 38). Fewer calves die during birth in Warduj than in the other districts. Again, mortality rates from “other” causes are high in smallstock than in cattle in all the districts, except in Argu where there are fewer deaths in sheep than in cattle. However, aggregate mortality rates presented for all the districts in the last column of the table suggest that both neo-natal deaths and “other” causes of deaths are far less in cattle than in sheep and goats. This is probably because farmers pay particular attention to cattle. Overall, however, mortality rates are not very high to account for low animal productivity.

Table 38: Livestock Births and Deaths (Percentages)

	Argu			Warduj			Zebok			All districts		
	Cattle	Sheep	Goats	Cattle	Sheep	Goats	Cattle	Sheep	Goats	Cattle	Sheep	Goats
Mortality rate (neo-natal)	9.5	24.3	26.5	1.4	9.7	20.6	3.2	19.2	10.7	4.6	16.7	19.1
Mortality rate (other)	1.7	1.6	2.8	1.2	6.1	7.1	1.4	1.9	1.0	1.6	3.4	4.2
Birth rate	70.8	58.4	62.3	79.3	77.1	78.3	74.4	67.9	75.5	74.9	68.3	73.4

Note: Mortality rate (neo-natal) is the number of neo-natal deaths divided by the number of births; mortality rate (other) is the number of other deaths divided by the herd size for each species; birth rate is the number of births divided by the total number of mature female animals.

4.5 Animal Diseases

There are many kinds of animal diseases, reported by farmers, that account for animal deaths and low productivity. These are tabulated in the table below:

Table 39: Common Animal Diseases and Parasites by Species

	Cattle	Sheep	Goats	Poultry	Donkey
Anthrax	xxx	xxx	xxx		
CCPP	xxx	xxx	xxx		
Enthrotoxemia					
Foot and mouth	xxx				
Pox diseases		xxx	xxx		
Liver fluke	xxx	xxx	xxx		
New castle				xxx	
Unknown					xxx

Anthrax is the most frequently reported disease in cattle by farmers in all the villages surveyed, while the others were mentioned but not as a big problem. For sheep and goat, the biggest problem appears to be liver fluke, but it is not clear whether the described disease was indeed LF. For goats contagious caprine pleuro pneumonia (CCPP) was reported as an important disease. Horses and donkeys are attacked by unknown diseases, most probably by anthrax. Though not reported by farmers it is widely thought that black leg, foot and mouth and internal parasites among cattle and smallstock and New Castle among poultry are also important animal health diseases. Veterinary services are available, but not in all the villages – hence many livestock owners still use traditional medicines to treat sick animals.

Although the magnitude couldn't be estimated, it is thought that these diseases account for a significant loss of livestock. However, an indirect impression can be obtained from farmers' response about the causes of livestock deaths, which are described under the category "other" in table 39. Nearly 95% of the farmers who claimed to have lost cattle mentioned diseases, including parasites and worms as the major cause of death in cattle. Equally, a high percentage, 90%, reported that sheep and goats died mainly from diseases. Feed shortage, severe cold winter and attack by wolves were also noted as the causes of animal deaths, but these account for a small percentage of the total response.

PART V. LIVELIHOOD SECURITY

This section looks into the economic circumstance of the sample households, giving particular attention to the relationship between poverty and livelihood (in) security thereby delimiting typical coping mechanisms adopted by households to ameliorate the effects of food deficit in particular.

5.1 Household Income and Expenditure

5.1.1 Household Income

Table 40 presents the average annual income per household obtained from farm and off-farm activities. Households are classified by farm size in order to capture relative inequalities in income between the households. It is noticeable that wage labour is the most important source of income in Warduj and Zebok, accounting for 34% and 38%, respectively, of the total income. In Argu, the share of income from other sources, primarily from the sale of poppy, in total income is much higher than from wage income. Nevertheless, the overall picture is that off-farm employment is a very important source of income for farm households in all the districts. It tends to be higher among the small farm size groups. In fact the pattern is that the smaller the farm size the higher the income earned from wage labour; with regard to large farm size groups the obverse is the case. It would seem that large farms are more prosperous and the family members don't need to resort to wage labour to earn income. It should be stressed that income from wage is mainly from work in the informal sector within Badakhshan, not from abroad as such.

The other important source of income is livestock. It accounts for 36% of the total income in Zebok, 30% in Warduj and 11% in Argu. Again the sale of animals follows more or less the same pattern as that of wage labour, increasing with an increase in farm size and vice versa. It is also noticeable that households of smaller farm size groups in particular do not sale food crops, fruit and vegetable to earn cash income. The principal reason is that there is not enough surplus to sale, as agriculture is very much a subsistence nature and the primary aim of households is to satisfy their own consumption. Warduj is the only district in which a sizeable proportion of income is generated from the sale of agricultural output.

Table 40: Percentage Distribution of Annual Income by Source and Farm Size (Afs)

(a) Argu

Source of income	Farm Size					Percent of Total ¹
	<15	15.1-30	30.1-45	45.1-60	>60	
Crop sale	0.0	2.4	18.6	7.1	6.7	8.2
Fruit sale	1.3	3.6	0.0	0.0	0.0	0.8
Wage labour	37.3	17.7	6.7	4.2	8.9	12.5
Vegetable sale	7.5	6.6	7.1	5.5	19.9	9.8
Firewood sale	2.3	0.0	0.8	0.0	0.0	0.5
Remittance	0.5	0.0	0.0	0.0	0.0	0.1
Livestock sale	4.7	11.7	12.4	11.3	13.6	11.4
Other sources	46.4	57.9	54.4	71.9	50.9	56.8
Percent of Total ²	12.6	17.12	25.63	20.8	23.8	100.00

(b) Warduj

Source of income	Farm Size						Percent of Total
	<5	5.1-10	10.1-15	15.1-20	20.1-25	>25	
Crop sale	0.0	2.5	4.9	5.1	37.2	8.2	9.3
Fruit sale	2.6	6.4	12.7	16.6	12.5	22.0	13.4
Wage labour	61.0	36.6	52.0	25.8	35.6	18.2	34.4
Vegetable sale	3.5	0.0	5.9	5.1	5.9	0.0	2.9
Firewood sale	1.3	1.0	1.4	0.0	0.0	1.9	1
Remittance	0.0	1.9	3.3	0.0	0.0	0.0	0.7
Livestock sale	20.7	22.2	9.4	45.3	8.7	49.7	29.8
Other sources	10.8	29.4	10.6	2.0	0.0	0.0	8.3
Percent of Total	11.8	18.5	11.8	17.9	14	26	100.00

(c) Zebok

Source of income	Farm Size				Percent of Total
	<3	3.1-7	7.1-11	>11	
Crop sale	0.0	0.0	2.1	0.0	0.3
Fruit sale	0.0	59.1	0.0	0.0	17.3
Wage labour	70.9	5.4	51.4	43.9	37.5
Vegetable sale	0.0	0.0	0.0	0.0	0.0
Firewood sale	0.0	0.0	0.0	0.0	0.0
Remittance	0.2	2.2	2.1	0.0	0
Livestock sale	18.1	22.2	40.8	48.9	35.6
Other sources	10.9	11.2	3.5	7.2	8.3
Percent of Total	13.7	29.2	15.4	41.6	100.00

¹Percentage for row data (income source) from total income;

² Percentage for column data (farm size) from total income.

5.1.2 Household Expenditure

Average annual household expenditures are estimated for farm size groups and the results are presented in Table 41. It is quite evident that expenditure on food items, mainly on the staple grains of wheat and rice, accounts for the highest expenditure category for most households. It constitutes more than 50% of the total expenditure in Argu and Warduj and 60% in Zebok. The other category of food items (gee, meat, tea and sugar) account for the bulk of the remaining cash expenditure, with no major variation between the districts.

An in-depth look at the expenditure pattern by farm size shows no relationship between the amount of money spent on wheat and farm size in all three districts. That is, farms with smaller holdings as well as larger holdings spend more money on wheat. This shouldn't be a surprise, because all the districts do not produce enough grain to satisfy demand for food and have therefore to allocate comparatively more of their cash income to purchase wheat. The remaining elements of the expenditure do not reveal definite pattern with relation to farm size. It is noticeable that there is virtually no expenditure on agriculture and related activities. The bulk of the expenditure incurred is on foodstuff and it reflects the precarious nature of the economy.

Table 41: Average Annual Household Expenditure by Farm Size (Afs)*(a) Argu*

	Farm Size											
Expenditure	<15.1		15.1-30		30.1-45		45.1-60		>60		Total	
	Afs	%	Afs	%	Afs	%	Afs	%	Afs	%	Afs	%
Wheat	6.33	44.24	4.00	35.70	3.76	42.20	2.98	42.33	2.84	41.46	19.91	41.20
Rice	1.21	8.46	1.10	9.81	0.78	8.75	0.46	6.53	0.75	10.95	4.30	8.90
Gee	1.61	11.25	1.23	10.97	1.14	12.79	0.83	11.79	0.78	11.39	5.59	11.57
Meat	1.63	11.39	1.42	12.67	1.05	11.78	0.69	9.80	0.96	14.01	5.75	11.90
Tea	1.36	9.51	1.70	15.17	0.71	7.97	0.57	8.10	0.53	7.74	4.87	10.08
Sugar	0.04	0.27	0.002	0.02	0.19	2.13	0.57	8.10	0.10	1.46	0.90	1.86
Kerosene	0.64	4.47	0.52	4.64	0.52	5.84	0.22	3.13	0.22	3.21	2.12	4.39
Fuel wood	0.02	0.13	0.01	0.07	0.01	0.11	0.00	0.00	0.00	0.00	0.037	0.08
Health	0.43	3.01	0.42	3.75	0.22	2.47	0.063	0.89	0.09	1.28	1.22	2.53
Clothing	1.04	7.27	0.81	7.23	0.53	5.95	0.66	9.38	0.58	8.47	3.62	7.49
Total	14.31	100.00	11.21	100.00	8.91	100.00	7.04	100.00	6.85	100.00	48.32	100.00
% of Total		29.61		23.20		18.44		14.58		14.17		100.00

(b) Warduj

	Farm Size													
Expenditure	<5		5.1-10		10.1-15		15.1-20		20.1-25		>25		Total	
	Afs	%	Afs	%	Afs	%	Afs	%	Afs	%	Afs	%	Afs	%
Wheat	4.62	44.68	2.55	44.82	2.06	36.08	1.73	41.61	1.38	38.60	1.05	52.21	13.40	42.50
Rice	0.75	7.25	0.45	7.91	0.42	7.36	0.37	8.90	0.34	9.51	0.16	7.96	2.50	7.90
Gee	0.88	8.51	0.66	11.60	0.64	11.21	0.34	8.18	0.57	15.94	0.19	9.45	3.30	10.40
Meat	1.00	9.67	0.24	4.22	0.88	15.41	0.16	3.85	0.25	6.99	0.04	1.99	2.60	8.20
Tea	1.38	13.35	0.83	14.59	0.76	13.31	0.56	13.47	0.50	13.99	0.28	13.92	4.30	13.70
Sugar	0.14	1.35	0.06	1.05	0.08	1.40	0.022	0.53	0.035	0.98	0.01	0.50	0.30	1.10
Kerosene	0.53	5.13	0.24	4.22	0.28	4.90	0.21	5.05	0.12	3.36	0.098	4.87	1.50	4.70
Fuel wood	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Health	0.26	2.51	0.17	2.99	0.10	1.75	0.09	2.07	0.10	2.80	0.063	3.13	0.80	2.50
Clothing	0.78	7.54	0.49	8.61	0.49	8.58	0.68	16.35	0.28	7.83	0.12	5.97	2.80	9.00
Total	10.34	100.00	5.69	100.00	5.71	100.00	4.16	100.00	3.58	100.00	2.011	100	31.50	100.00
% of Total		32.83		18.06		18.13		13.20		11.35		6.38		100.00

(c) Zebok

	Farm Size									
Expenditure	<4		4.1-8		8.1-11		>11		Total	
	Afs	%	Afs	%	Afs	%	Afs	%	Afs	%
Wheat	7.46	52.30	2.83	64.32	3.23	54.75	2.05	58.30	15.60	55.46
Rice	1.24	8.69	0.025	0.57	0.22	3.73	0.05	1.40	1.50	5.47
Gee	1.46	10.24	0.38	8.64	0.58	9.83	0.34	9.70	2.76	9.83
Meat	0.08	5.61	0.00	0.00	0.25	4.24	0.15	4.30	1.20	4.27
Tea	1.59	11.15	0.64	14.55	0.64	10.85	0.35	10.00	3.22	11.47
Sugar	0.093	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.33
Kerosene	0.56	3.93	0.17	3.86	0.35	5.93	0.14	3.80	1.22	4.33
Fuel wood	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Health	0.26	1.82	0.04	0.91	0.15	2.54	0.08	2.30	0.53	1.89
Clothing	0.80	5.61	0.31	7.05	0.48	8.14	0.36	10.20	1.95	6.95
Total	14.30	100.00	4.40	100.00	5.90	100	3.52	100.00	28.10	100.00
% of Total		50.80		15.60		21.00		12.51		100.00

Virtually all the sample households in all the three case-districts have “liveable” houses, measured by local standards. Average number of shalwarkamis is slightly higher in Argu, about 3 per person. Averages however disguise the actual difference apparent between the households. There are households whose members own about five pairs of shalwarkamis per person compared to those who own just a pair. In this respect households in Zebok are relatively less well-off; the maximum of shalwarkamis an individual owns is three pairs. All households consume, on average, three meals a day, obviously with varying quantity and quality. Seasonality also influences the number of meals per day – it tends to be slightly higher in the winter months than in the summer, presumably because people need to produce enough calories in the winter to stay warm.

Table 42: Some Basic Indicators of Livelihood Security

	Argu	Warduj	Zebok
Former refugee status (%)	12	3	76
Liveable houses (%)	100	95	98
Average number of clothes/person	2.6	2.2	2.1
(maximum/minimum)	5/1	4/2	3/2
Average number of meals per day	3.0	3.0	3.0

Annex 1: Fieldwork Plan for the Baseline Survey

No.	Tasks	Location	Date
1	Training of interviewers	Faizabad	24 - 25 Nov
2	Meeting with Argu CD staff and selection of sampled villages	Argu	25 Nov
3	Interview and data collection from sampled villages in Argu	Argu	26 Nov to 2 Dec
4	Meeting with Warduj CD staff and selection of sampled villages	Warduj	3 Dec
5	Interview and data collection from sampled villages in Warduj	Warduj	4 - 10 Dec
6	Meeting with Zebok CD staff and selection of sampled villages	Zebok	12 Dec
7	Interview and data collection from sampled villages in Zebok	Zebok	13 – 19 Dec
8	Return to Peshawar	Faizabad- Peshawar	21 Dec

5.2 Food Security

5.2.1 Direct Food Entitlement

Access to food is largely determined by the food each household produces (direct entitlement). The grains, vegetable as well as the various types of fruit that households grow represent the most important source of food for consumption as well as for cash. Table 43 presents summary statistics for the main cereal crop, wheat, for the districts. Mean wheat output per household is extremely low, both in real and relative terms in Zebok; it tends to be even much lower in the first two household size groups. Overall, the average output per household in Argu is nearly twice more than in Warduj.

Table 43: Mean Wheat Output Per Household (seer)*

District	Household size				
	3 – 6	7 - 10	11 – 14	>14	Overall
Argu	105.05	301.10	318.00	546.00	286.48
Warduj	104.77	96.32	203.88	363.22	151.03
Zebok	21.33	27.76	36.18	64.07	40.54

* 1 Seer is equal to 7 kg

Table 44: Per Capita Wheat Availability

(a) by household size (kg/person)

District	Household size				
	3 - 6	7 - 10	11-14	>14	District average
Argu	137.4	242.3	172.2	216.9	206.9
Warduj	148.0	80.7	113.7	125.7	112.1
Zebok	36.9	22.8	20.1	30.9	21.9
Total	114.7	147.9	113.4	100.3	113.6

(b) by farm size (kg/person)

Argu	Farm size (jerib)					District average
	<15	15.1-30	30.1-45	45.1-60	>60	
Wheat quantity	97.8	77.6	99.5	110.4	65.0	93
No. of households	35	16	13	5	5	74

Warduj	Farm size (jerib)						District average
	<5	5.1-10	10.1-15	15.1-20	21.1-25	>25	
Wheat quantity	153	120.4	118.7	153	81.4	113.8	118
No. of households	28	15	8	3	5	4	63

Zebok	Farm size (jerib)				District average
	<3	3.1 -7	7.1 -11	>11	
Wheat quantity	57.4	48	42	56.3	48.2
No. of households	17	17	5	4	43

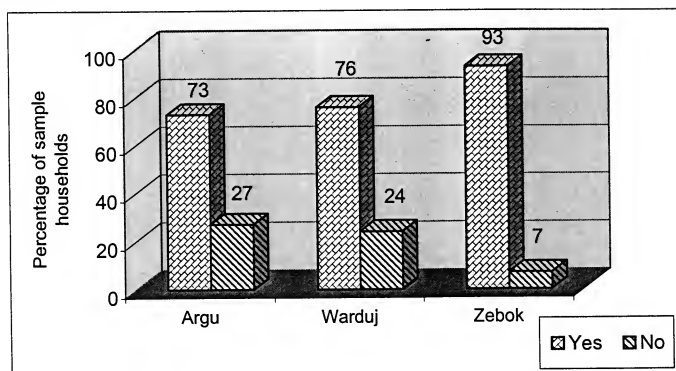
There is a direct association between household size and food availability – the smaller the household, the higher the per capita food while the obverse is true for larger households and this is demonstrated in table 44 above. However, when households are classified by farm size, small size operators have far better per capita wheat, both in relative (relative to other farm size groups) and absolute terms. This is because they have fewer persons per household. They are also cropping all their land and reaping higher yield per unit land unlike the larger farm households. Thus, the average for this group of farm households is high in all the districts; Warduj has the highest per capita wheat and Zebok the lowest. While inter-farm differences depict this picture, the overall per capita wheat production is low, except in Warduj where farmers have achieved self-sufficiency from their own production. In Zebok, per capita wheat output is extremely lower than the target 97 kg per person which Afghans themselves consider necessary. Per capita wheat in Argu is also below the minimum required. At the present level of technology, the lack of arable land imposes strict limits on increasing production by expanding area cropped. An increase in productivity is possible, but this demands inputs (improved seed variety and fertiliser) and extension services for better farm management.

When looking at the basic issue of food security, we also need to look beyond the size of own production. Vulnerability to food shortage can also occur due to lack of access to get it, even when surpluses are available in the market. The section ahead looks at the extent of food deficit and the various coping strategies adopted by farm households.

5.2.2 Indirect Food Entitlement

A significant proportion of the sample households in all the districts are experiencing seasonal food insecurity due to the failure of the agricultural system as well as the coping strategies to meet household needs. In Zebok, more than 90% of the households are in food deficit, compared to 76% in Warduj and 73% in Argu (Figure 20).

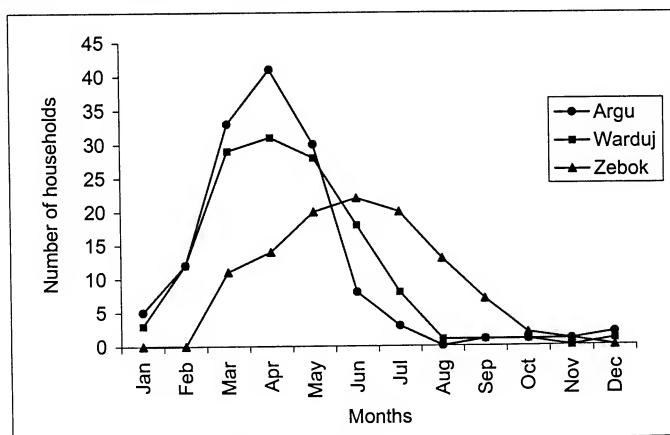
Figure 20: Percentage of Households Experiencing Food Deficit



5.3 Seasonality in Food Deficit

At least half the sampled households in each district experience food-deficit for the best part of the year. The peak of the food-deficit months coincide with the lean season. In Figure 21 seasonality is graphed against the number of households experiencing food-deficit. The pattern is that food-deficit begins to be felt in February or even earlier, building up the momentum and reaching the peak in April in Argu and Warduj before leveling off in June and July when the harvest is collected. In Zebok, by contrast, June and July are the peak food-deficit months because wheat is harvested late, in November. The food-deficit months are spread across over a longer period.

Figure 21: Seasonality of Food Deficit

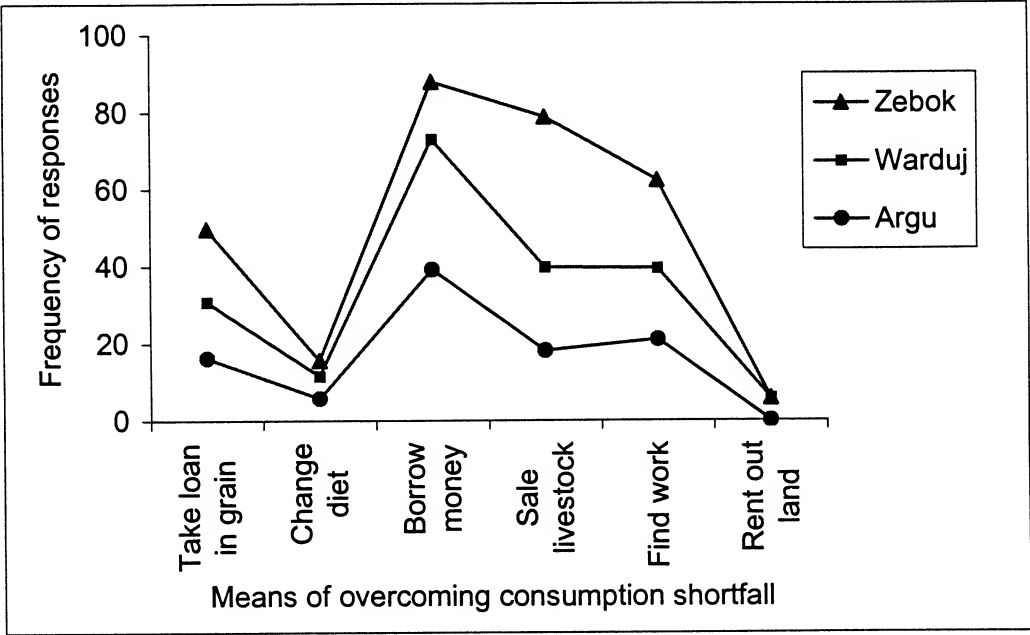


5.4 Coping Strategies

5.4.1 Market and Social Networks

Households facing food deficit have resorted to specific coping strategies: some are relying on social network to borrow cash or grain, others sale assets like animals and seek work. In very extreme cases, households rent out their land. Figure 22 depicts the frequency distribution of responses households have given to ameliorate food shortage.

Figure 22: Coping with Food Deficit



It is apparent that the “market” plays a significant role in household coping strategies. In Zebok, borrowing money and selling animals are the two dominant coping strategies, followed by wage labour. In Warduj, too, people cope by borrowing money but they also take grain in loan from the local shopkeepers and farm households. The strategy appears to be essentially the same in Argu as well but more diversified. In very extreme cases, people resort to changing their diet – from the staple grains of wheat or rice to maize and millet. Some households also said they not only switch to the less preferred grains but actually decrease the quantity of food they consume.

5.4.2 Food Purchase

Households not producing enough to ensure annual food requirements from their farms supplement own production with purchase. Grains are sold in modest scale in the villages. Most households, therefore, obtain their supplies from village bazaars. Still a large number of people travel to district-centre markets or even farther than that to purchase supplies, both food and non-food items. Table 45 indicates how frequently people travel to the nearest markets to buy food items and other basic

necessities. Markets in Argu are mostly visited weekly. In Warduj, the nearest markets are visited very often, whereas in Zebok the frequency of traveling is either monthly or annually.

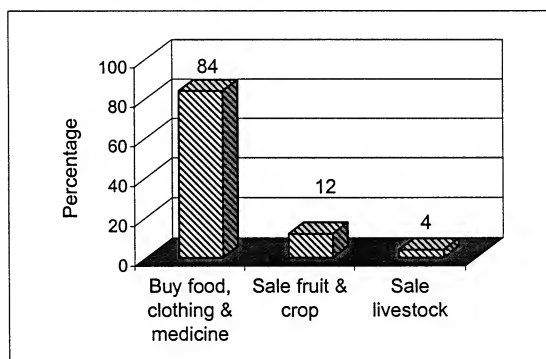
Table 45: Frequency of Traveling to Nearest Market (percentage of sample population)

District	Weekly	Monthly	Annually
Argu	64.0	36.0	0.0
Warduj	3.5	65.5	31.0
Zebok	0.0	60.0	60.0

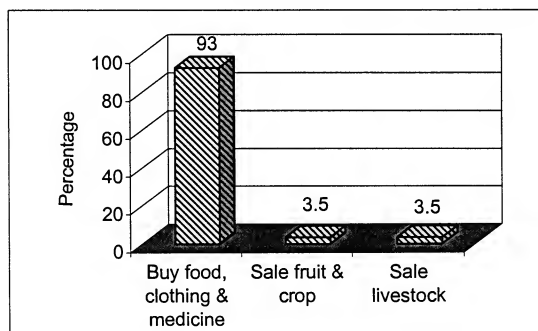
Figure 23 depicts that markets are visited primarily to buy foodstuff. Over 80% of the respondents in each district said they travel to markets to buy foodstuff; medicines and clothing are also purchased but only when required. Some households also travel to markets to sale fruit, but this is very much seasonal. Households facing food deficit also visit markets to sale animals to buy food items.

Figure 23: Purpose of Travelling to Markets

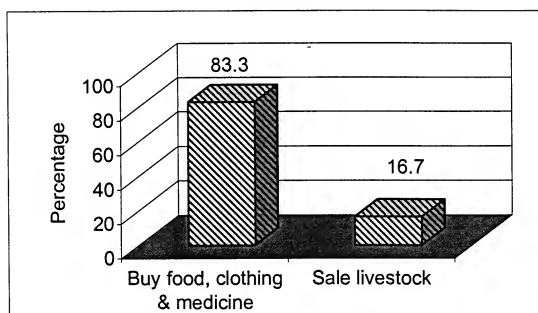
(a) Argu



(b) Warduj



(c) Zebok



The problem of inadequate subsistence production is compounded, to a certain extent, by food sales shortly after the harvest – most likely at depressed prices – to meet essential cash needs for clothing, fuel, health care and the like. These households deplete their stocks several months before the next harvest and have to rely on market purchases— often at increased prices— or non-market transfers to meet their food requirements during the lean season. Table 46 provides a summary information of sales and prices. Nearly 60% of the total sample households or 78% of the households engaged in trade in Argu have sold their meagre surplus immediately after the harvest. In Warduj, not many households sale; among those who sold, the majority did so immediately after the harvest. Zebok being a food deficit district, not even a single household has sold wheat output.

Table 46: Surplus Disposal Pattern and Prices (percentage of those selling)

District	Disposal pattern and prices								
	Immediately			Within three month			After a year		
	No. of households	% received good price	% received bad price	No. of households	% received good price	% received bad price	No. of households	% received good price	% received bad price
Argu	46	8.7	91.3	13	0	100	1	0	100
Warduj	12	0	100	2	0	100	1	0	100
Zebok	0	0	0	0	0	0	0	0	0

5.4.3 Wage Labour

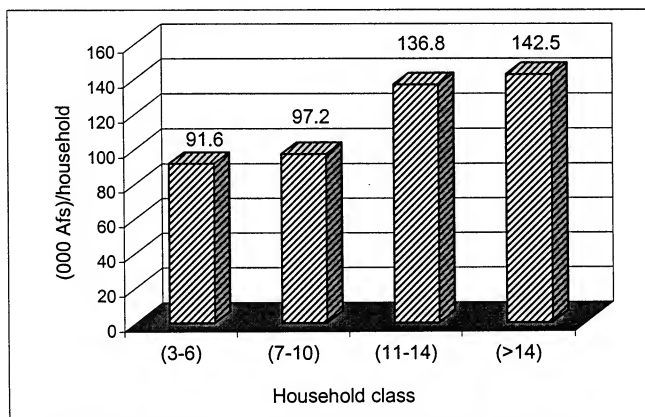
Wage labour for agricultural activities is not widely known; if it does, it is only for the peak planting and harvesting months. Moreover, wages are often paid in-kind, mostly food. Seasonal and long-term labour migration is not known widely in Badakhshan, presumably because of its relative

isolation from the rest of Afghanistan as well as Pakistan where people from other parts of the country go to work. Even during the war, only a few households have left their village locations in search of jobs. The survey shows that 15 households in Argu have one or two persons away from home working elsewhere. In Warduj, 5 households have one person each away working. Labour migration is also not prominent in Zebok where only 7 households expect to earn some remittance from family members working elsewhere.

5.5 Credit

It is characteristic of a subsistence economy that most households are involved in credit transactions as food stocks are inadequate for the entire crop season. In Figure 24 average borrowing per household is graphed against household size for the sample population. The pattern is that the amount borrowed tends to increase with an increase in household size.² Households with members greater than 14 persons have borrowed more than one and half times than households with 3-6 persons.

Figure 24: Average Amount of Money Borrowed by Household Class



When the data are disaggregated by district (see Table 47), at least 65% of the sample households in each district had borrowed money last season, suggesting the precarious economic situation of the people. The average amount borrowed per household was 140,000 Afs in Argu, about a third more than the amount borrowed in Warduj and Zebok. In Argu, shopkeepers have extended the largest credit, whereas in Warduj and Zebok, most transactions were done with relatives probably

² The correlation between credit and household size is very weak, however; $r = 0.25$

Table 47: Subsistence Credit Transaction

	Source and amount borrowed by line item				
	Shopkeepers	Villagers	Friends	Relatives	Total of sample
Argu					
Number of households borrowed	20	12	7	12	51
Percent of households borrowed (of total households borrowed)	39.2	23.5	13.7	23.5	68 ^a
Total amount borrowed (000Afs)	3285	1695	1050	1052	7082
Average amount borrowed per household (000Afs)	164.3	141.3	150.0	87.7	138.9
Purpose (frequency percentage) ¹					
Food	63.6	13.6	13.6	9.1	(22) 43.1 ^b
Seed and fertiliser	42.9	14.3	14.3	28.5	(7) 13.7
Social (wedding, etc)	75.0	25.0	0.0	0.0	(4) 7.8
Livestock	50.0	0.0	25.0	25.0	(4) 7.8

	Source and amount borrowed by line item				
	Shopkeepers	Villagers	Friends	Relatives	Total of sample
Warduj					
Number of households borrowed	11	15	3	10	39
Percent of households borrowed (of total households borrowed)	28.2	38.5	7.7	25.6	65 ^a
Total amount borrowed (000Afs)	1011	1090	183	1406	3690
Average amount borrowed per household (000Afs)	91.9	72.7	61.0	140.6	94.6
Purpose (frequency percentage) ¹					
Food	32.3	32.3	6.5	29.0	(31) 100.0 ^b
Social (wedding, etc)	33.3	66.7	0.0	0.0	(3) 9.7

	Source and amount borrowed by line item				
	Shopkeepers	Villagers	Friends	Relatives	Total of sample
Zebok					
Number of households borrowed	8	3	3	13	27
Percent of households borrowed (of total households borrowed)	29.6	11.1	11.1	48.1	71.1 ^a
Total amount borrowed (000Afs)	760	73	542	905	2280
Average amount borrowed per household (000Afs)	95.0	24.3	180.7	69.6	84.4
Purpose (frequency percentage) ¹					
Food	42.1	5.3	15.8	36.8	(19) 50.0 ^b
Health and clothing	0.0	0.0	0.0	100.0	(3) 7.9

¹ Read across the row ^a Calculated as percentage of total households in sample; ^b Calculated as percentage of total households who borrowed; figures in brackets are number of households.

because there are few shopkeepers in these two districts that are able to extend credit at this level. Borrowing was essentially to purchase food items to cushion food shortage during the lean months, but some households have also borrowed to pay for social expenses; credit for agricultural activities accounts for a very negligible proportion of the total transaction.

Credit is seasonal, moving up and down with the harvesting season, as depicted in Figure 21. March appears to be the most critical month where borrowing peaks. In Argu, more than 50% of the annual borrowing was in March; in Warduj and Zebok this percentage is somewhat low but nonetheless significant. By the time the harvest is collected in the summer, demand for credit tends to ease up. This is obvious from the Argu and Warduj data where there is no or little transaction after May. The transaction begins again sometime in mid-winter by which time food stocks have been depleted. By contrast, as the harvest in Zebok is collected much later than Argu and Warduj, the summer months are characterised by high credit demand. This suggests that credit in Badakhshan serves the function of insurance against consumption shortfall.

Table 48: Seasonality of Credit, Mode of Payment and Collaterals

	Argu	Warduj	Zebok
Seasonality			
(Percentage of households borrowed)	74.7	60.0	78.9
March	53.6	38.9	23.3
April	21.4	33.3	0.0
May	13.3	11.1	13.3
June & July	2.0	8.7	20.0
Winter months*	8.7	8.0	43.0
Households still in debt (% of total sample in district)	40.0	63.3	57.9
Average amount owed per household (000 Afs)	95.7	83.7	76.0
Mode of payment (percentage of those in debt):			
In cash	73.3	88.3	77.8
In labour	20.0	11.7	7.4
In crop	6.7	0.0	14.8
Able to save (percentage of borrowers)	28.6	13.3	10.5
Collateral (percentage of borrowers)**			
Relatives	0.0	9.8	14.3
Friends	15.7	19.5	61.9
Land and livestock	17.6	12.2	14.3
Poppy cultivation	7.8	0.0	0.0
Written documents	56.9	58.5	9.5

* Starting from October. ** Frequency distribution of responses

As all transactions are done at the village level, collaterals are symbolic, because default would automatically ostracise the individual from the village life. A significant proportion of the borrowers also didn't require collateral as they borrowed from friends and relatives. A single collateral may not always be enough to conclude the transaction. In this case borrowers will have to submit a set of productive assets like land and livestock and this agreement can be formalised in a written document or just verbally agreed in the presence of village elders. Hence, a large proportion of the borrowers, particularly in Argu and Warduj, signed formal documents. It is also interesting to note that some lenders in Argu are demanding that borrowers grow poppy and sale it to them at harvest time. Such lenders are likely to be the local poppy traders and from the borrowers point of view "interlinked transactions" of this nature perpetuate rural poverty as the borrower is literally mortgaging his "crop" at pre-determined prices before it is even harvested. Such a transaction can also increase the risk of family food insecurity as the borrower is compelled to grow poppy at the expense of subsistence food crops.

Typically, loans are for one year, but rollover is also common. At the time of the survey, about 40% of the sample households in Argu, 63% in Warduj and 58% in Zebok were still in debt. Each household owed, on the average, 96,000 Afs in Argu, 84,000 Afs in Warduj and 76,000 Afs in Zebok. Outstanding loans will be paid largely in cash, but crop and labour service are also common ways of settling debts. Loans are paid with interest, but stipulating the rate proved difficult. The precarious economic condition of the people is such that only a small proportion of the households are able to save.

PART II. POPULATION CHARACTERISTICS

2.1 Households Composition

2.1.1 Area Population

Two different sources provided information about the population of Badakhshan over the last two decades. The first is a population census conducted by the government of Afghanistan in 1979 and, the other, by Eighmy, an estimate for 1979 and a projection for 1990. The two districts of Argu and Warduj covered by Afghanaid survey are not identified separately in the 1979 and 1990 studies. Warduj was included in Baharak district and Argu in Faizabad district. Zebok district already existed as an entity. However, it is possible to use these sources as well as the present survey to study the population densities of each district and their evolution over the last two decades.

Table 2: Population Density per sq.km., 1979 - 1999

District	DRA 1979	Eighmy 1979	Eighmy 1990	AAD 1999
Baharak (Warduj for 1999 data)	16	15.2	18.1	19.7
Faizabad (Argu for 1999 data)	47	41.1	48.4	53.3
Zebok	1	2.0	3.0	2.8

Although the data provided by the population census (DRA) and Eighmy for 1979 differ, Table 1 shows that the population density regularly increased between 1979 and 1999. For Argu and Warduj districts it shows an upward trend whereas the population density for Zebok seems to have stabilised since 1990

2.1.2 Households Size

The increase in the population density means that villages and households will have to reorganise and adapt themselves to the reduced area per capita. Table 3 shows the household size since 1979.

Table 3: Household Size, 1979 – 1999

District	DRA 1979	UNIDATA 1990	AAD 1999
Baharak (Warduj for 1999 data)	6.3	6.9	9.64
Faizabad (Argu for 1999 data)	5.7	7.6	9.34
Zebok	7.9	n.a.	12.64

Note: n.a. stands for not applicable

For all the districts, the mean household size has increased significantly in 1999 over the previous two periods, suggesting that less fission is taking place. Households are also larger because of the desire to pool resources together. The mean household size in Warduj and Zebok has almost doubled. In Table 4, households are classified according to their number of members, and for each group it shows the mean number of persons living within a household.

Table 4: Mean Household Size

District	Measure	Household size					F test
		3-6	7-10	11-14	>14	Overall	
Argu	Mean	5.37	8.72	12.44	17.33	9.64	0.00
	St dev	1.01	0.90	1.21	2.40	3.83	
Warduj	Mean	4.92	8.36	12.60	20.22	9.34	0.00
	St dev	1.02	1.22	0.97	6.40	5.55	
Zebok	Mean	5.50	8.54	12.64	19.50	12.64	0.00
	St dev	0.84	1.27	1.29	6.53	6.43	
Total	Mean	5.16	8.57	12.54	19.09	10.22	0.00
	St dev	1.01	1.12	1.14	5.59	5.28	

Note: Standard deviation (St dev) is a measure of variability of a data set around its mean

F test is calculated to determine if the mean values obtained for each group are statistically different from each other

Logically, an increase in the number of persons implies an increase in the average household size. The number of persons per household for households less than 11 members is comparable in all the three districts. On the other hand, households more than 14 persons tend to be larger in Warduj and Zebok than in Argu. The F test indicates that the difference between the household size classes is statistically significant. The low standard deviation indicates that groups are fairly homogeneous—that is, all the values are close to the mean. Only in Warduj and Zebok, the high standard deviation for the over 14 members size shows that there are large variations in the number of persons per household within this class.

The overall mean household size appears to be much higher in Zebok than in Argu and Warduj as indicated in Table 5. In Zebok, around 75% of the population live in households of more than 11 members. By contrast, just over half the population of Argu and Warduj live in households less than 11 persons.

Table 5: Population and Household Distribution

District	Measure	Household size			
		3-6	7-10	11-14	>14
Argu	% of total population	13	41	26	20
	% of total households	24	45	20	11
Warduj	% of total population	18	33	20	29
	% of total households	35	37	15	13
Zebok	% of total population	6	20	25	49
	% of total households	14	29	25	32
Total	% of total population	13	32	24	31
	% of total households	25	39	19	17

2.1.3 Age Structure

The age structure of the households is given in Table 6. Although most children are actively involved in household work before the age of 15, this age has been considered as a cut-off point to distinguish children from adults. Children under 15 years old are supposed to depend partially or totally on their elders and parents.

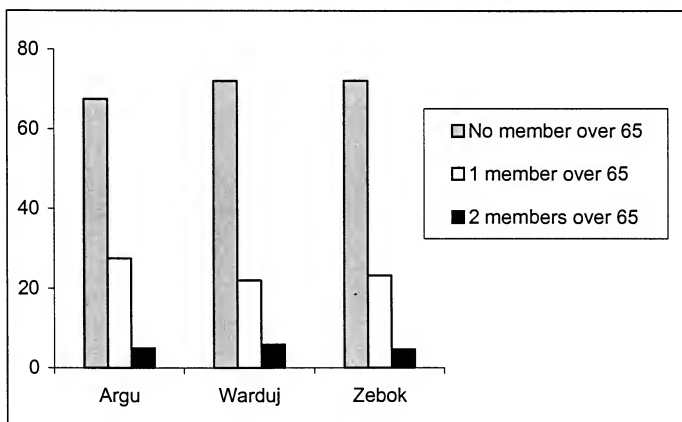
Table 6: Mean Number of Children (<15) and Adults (>15) by Household Size

District	Measure	Members<15 years				F test	Members>15years				F test
		3-6	7-10	11-14	>14		3-6	7-10	11-14	>14	
Argu	Mean	2.79	4.19	6.44	9.33	0.00	2.58	4.53	6.00	8.00	0.00
	St dev	0.92	1.97	2.06	3.50		0.90	1.92	1.71	1.73	
Warduj	Mean	2.08	4.48	6.50	11.22	0.00	2.83	3.88	6.10	9.00	0.00
	St dev	1.41	1.78	1.08	5.02		1.27	1.67	1.29	2.87	
Zebok	Mean	2.33	3.31	6.27	9.07	0.00	3.17	5.23	6.36	10.43	0.00
	St dev	1.37	1.25	2.10	5.23		1.47	1.83	1.75	3.11	

Table 6 shows that the proportion of children and adults both increases with the size of the household. In Argu and Warduj, the children population tends to be higher than the adult population. This pattern is especially true for the largest household size in Warduj where the average number of children exceeds that of adults by more than 2. Only the class [7-10] in Argu and [3-6] in Warduj undermine this general trend. The picture is opposite in Zebok district where the proportion of adults exceeds that of children, regardless of the household size. The standard deviation for the children population in households with more than 14 members is particularly high for Warduj and Zebok districts.

People over 65 years old have been considered as a specific group within this survey. They are dependent members for their household. 30% of the households have at least 1 member over 65. One person interviewed reported 3 members over 65 out of 7. The distribution per district is presented in Figure 2.

Figure 2: Percentage of Households with Persons over 65 Years Old



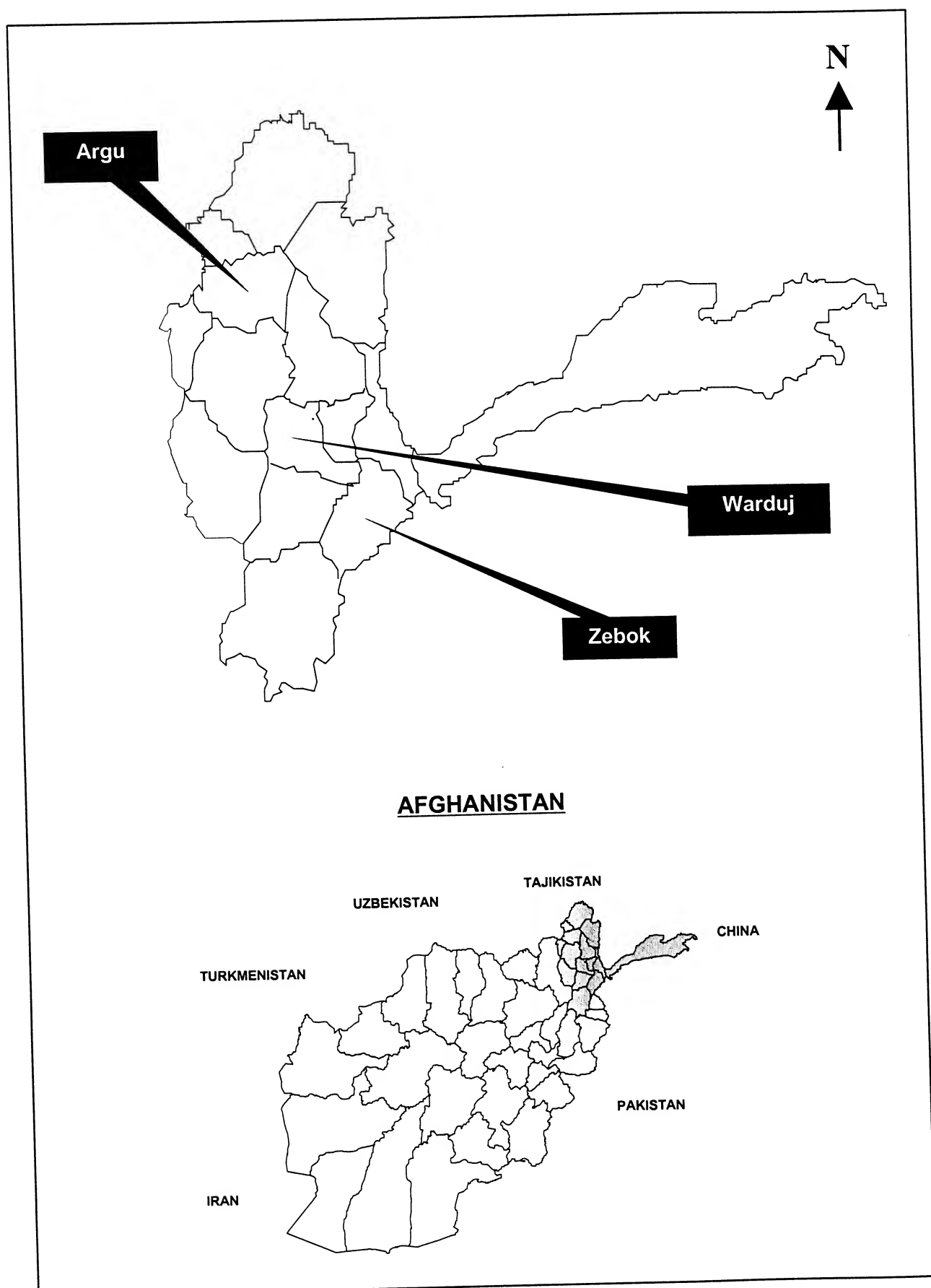
The large proportion of households with no members over 65 indicates that only a small part of the population reaches the age of 65.

To conclude, about 51% of the population in Argu, 52% in Warduj and 45% in Zebok are below the age of 15 years. This high young population is translated into high dependency ratio, as shown in the following section.

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BADAKHSHAN PROVINCE
(Districts covered by the baseline survey)



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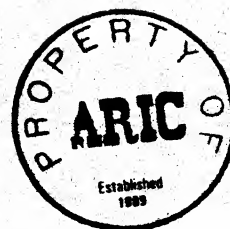
BADAKHSHAN

BASELINE

SURVEY

REPORT

Argu, Warduj and Zebok Districts



Monitoring and Research Unit
September, 2000

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